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(54) Title: NOVEL ALKYL TETRALIN ALDEHYDE COMPOUNDS

(57) Abstract

The present invention relates, inter alia, to novel alkyl tetralin aldehyde compounds having fragrant musk-like aroma.

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NOVEL ALKYL TETRALIN ALDEHYDE COMPOUNDS

CROSS REFERENCE TO RELATED APPLICATION

This application is a continuation-in-part of copending patent application U.S. Serial No. 080,078, filed June 18, 1993, the disclosures of which are hereby incorporated herein by reference in their entirety.

BACKGROUND OF THE INVENTION

The present invention relates, inter alia, to novel alkyl tetralin aldehyde compounds having fragrant musk-like aroma.

Musk fragrances are in great demand for use in various products such as in perfumes, colognes, cosmetics, soaps and others. However, natural musk, which is obtained from the Asian musk deer, is extremely scarce and is quite expensive. Accordingly, fragrance chemists have spent considerable time searching for synthetic products which duplicate or closely simulate this natural musk scent.

As a result of these research efforts, a number of different synthetic musks have been discovered. Among such synthetic compounds is a derivative of 1,1,3,4,4,6-hexamethyl-1,2,3,4-tetrahydronaphthalene (HMT). HMT, for example, is converted to 7-acetyl-1,1,3,4,4,6-hexamethyl-1,2,3,4-tetrahydronaphthalene, to yield a well known musk perfume of the tetralin series. Because of its clean musk fragrance and its ability to retain that fragrance over long periods of time, this compound is of great commercial value as a synthetic musk perfume substitute for the expensive, natural musk perfumes of the macrocyclic ketone series.

New and or better musk aroma compounds are needed to meet the demands of the fragrance industries. The present invention is directed to this, as well as other, important ends.

5 <u>SUMMARY OF THE INVENTION</u>

The present invention provides novel compounds of the formula [I]:

[I]

wherein

10 R^1 is $-CH_3$, $-CH_2CH_3$, $-OCH_3$ or -OH, R^2 and R^3 are, independently, -H, $-CH_3$, $-CH_2CH_3$, $-OCH_3$, -OH or -C(O)H,

R4 is -H,

 R^5 is -H, -CH₃ or -CH₂CH₃,

or R^4 and R^5 , taken together, are $-(CH_2)_2$ -,

R⁶ is -CH₃ or -CH₂CH₃,

 R^7 is -H, -CH₃ or -CH₂CH₃,

or R^6 and R^7 , taken together, are -(CH_2)₃-,

 \mbox{R}^{8} and \mbox{R}^{9} are, independently, -H, -CH $_{3}$ or -CH $_{2}\mbox{CH}_{3},$ and

20 R¹⁰ is -CH₃,

provided that

- (i) one of \mathbb{R}^2 and \mathbb{R}^3 is -C(0)H, and one of \mathbb{R}^2 and \mathbb{R}^3 is other than -C(0)H,
- (ii) no more than one of R⁵ and R⁹ is -H,
- 25 (iii) no more than one of R^5 , R^6 , R^7 , R^8 and R^9 is $-CH_2CH_3$,
 - (iv) when R^1 is $-OCH_3$, then R^2 and R^3 are other than -H or -OH,
- (v) when R^1 is -OH, then R^2 and R^3 are other than -OH or -OCH₃,

- (vi) when R^1 is $-CH_3$ or $-CH_2CH_3$, then at least one of R^7 and R^8 are H_1 ,
- (vii) when R^4 and R^5 , taken together, are -(CH_2)₂-, then R^1 is -OCH₃ or -OH, R^7 is -H, and R^8 is -H,
- 5 (viii) when R^6 and R^7 , taken together, are -(CH_2)₃-, then R^1 is -OCH₃ or -OH, and R^8 is -H,
 - (ix) when R^1 is $-CH_3$ or $-CH_2CH_3$, then one of R^2 and R^3 is $-OCH_3$ or -OH,

and

when R^1 is -OCH₃ or -OH, R^3 is -CH₃ or -CH₂CH₃, and both R^7 and R^8 are -H, then at least one of R^5 , R^6 and R^9 is other than -CH₃.

The foregoing compounds possess an active musk aroma having utility in the fragrance industry. The compounds of the invention may be used alone, or in combination with carriers, additional perfumery materials, and/or other ingredients, to provide various products, such as perfumes, colognes, soaps, and cosmetics.

DETAILED DESCRIPTION OF THE INVENTION

As noted above, the present invention is directed to novel musk compounds of the formula [I]:

[I]

In the above formula [I], the R substituents may be selected as follows: R¹ may be selected from the group consisting of -CH₃, -CH₂CH₃, -OCH₃ and -OH; R² may be selected from the group consisting of -H, -CH₃, -CH₂CH₃, -OCH₃, -OH and -C(O)H; R³ may be selected from the group consisting of -H, -CH₃, -CH₂CH₃, -OCH₃, -OH and -C(O)H; R⁴ may be -H; R⁵ may be selected from the group consisting of -H, -CH₃ and -CH₂CH₃; or R⁴ and R⁵, taken together, may be -(CH₂)₂-; R⁶ may be selected from the group consisting of -CH₃ and -CH₂CH₃; R⁵ may be

selected from the group consisting of -H, -CH₃ and -CH₂CH₃; or R⁶ and R⁷, taken together, may be -(CH₂)₃; -R⁸ may be selected from the group consisting of -H, -CH₃ and -CH₂CH₃; R⁹ may be selected from the group consisting of -H, -CH₃ and -CH₂CH₃; and R¹⁰ may be -CH₃.

As the above indicates, the compound of formula [I] may be a bicyclic compound, where R^4 and R^5 are other than $-(CH_2)_2$ -, and R^6 and R^7 are other than $-(CH_2)_3$ -. The compound of formula [I] may alternatively be a tricyclic compound by virtue of R^4 and R^5 being taken together as $-(CH_2)_2$ -, such as a compound of the formula [II]:

Similarly, the compound of formula [I] may alternatively be a tricyclic compound by virtue of R⁶ and R⁷ being taken together as -(CH₂)₃-, such as a compound of the formula [III]:

[III]

The foregoing selection of R substituents should, however, be made with the following qualifications in mind:

20 that one of R² and R³ is -C(O)H, and the other of R² and R³ is other than -C(O)H; that no more than one of R⁵ or R⁹ is -H; that no more than one of R⁵, R⁶, R⁷, R⁸ or R⁹ is -CH₂CH₃; that

when R^1 is -OCH3, then R^2 and R^3 are both other than -H or -OH; that when R^1 is -OH, then R^2 and R^3 are both other than -OH or $-OCH_3$; that when R^1 is $-CH_3$ or $-CH_2CH_3$, then one or both of $\ensuremath{\mbox{R}^7}$ and $\ensuremath{\mbox{R}^8}$ are H; that when $\ensuremath{\mbox{R}^4}$ and $\ensuremath{\mbox{R}^5}$, taken together, are 5 $-(CH_2)_2$ - (that is, a tricylic compound, where the third ring structure is at the R^4 and R^5 position), then R^1 is -OCH $_3$ or -OH, R^7 is -H, and R^8 is -H; that when R^6 and R^7 , taken together, are $-(CH_2)_3$ - (that is, a tricylic compound, where the third ring structure is at the R^6 and R^7 position), 10 then R^1 is -OCH $_3$ or -OH, and R^8 is -H; that when R^1 is -CH $_3$ or $-CH_2CH_3$, then one of R^2 and R^3 is $-OCH_3$ or -OH; and that when all of the following is true -- R^1 is -OCH $_3$ or -OH, R^3 is -CH $_3$ or $-CH_2CH_3$, and both R^7 and R^8 are -H -- then at least one of R^5 , R^6 and R^9 is other than -CH₃. 15

For reasons of their fragrance characteristics, synthesis advantages, formulation benefits, and/or other values, the following are preferable classes of compounds within the scope of Formula [I]:

Compounds of Formula [I] wherein R^1 is $-CH_3$, -OH or -OCH3;

Compounds of Formula [I] wherein R^2 is -C(0)H;

- Compounds of Formula [I] wherein R3 is -CH3 or -CH₂CH₃;
- Compounds of Formula [I] wherein \mathbb{R}^1 is -OH or -OCH $_3$, R^2 is -C(O)H, R^3 is -CH $_3$ or -CH $_2$ CH $_3$, R^4 is -H, R^5 is -CH₃, R^6 is -CH₃, R^7 is -H or CH₃, R^8 is -H or -CH₃, R^9 is -CH₃, and R^{10} is -CH₃;
- Compounds of Formula [I] wherein \mathbb{R}^1 is -OH or -OCH $_3$, \mathbb{R}^2 is -C(O)H, \mathbb{R}^3 is -CH $_3$, \mathbb{R}^4 and R^5 , taken together, are $-(CH_2)_2-$, R^6 is - CH_3 , R^7 is -H, R^8 is -H, R^9 is -CH $_3$, and R^{10} is -CH₃; and
- Compounds of Formula [I] wherein \mathbb{R}^1 is -OH or -OCH3, R^2 is -C(O)H, R^3 is -CH3, R^4 is -H, R^5 is -CH $_3$, R^6 and R^7 , taken together, are -(CH $_2$) $_3$ -, R^8 is -H, R^9 is -CH₃, and R^{10} is -CH₃.

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Specific compounds of Formula [I] which are most preferred, for reasons of fragrance characteristics, synthesis advantages, formulation benefits, and/or other values are as follows:

- The compound of Formula [I] wherein R¹ is OCH₃, R² is -C(O)H, R³ is -CH₃, R⁴ is -H, R⁵ is
 -CH₃, R⁶ is CH₃, R⁷ is -CH₃, R⁸ is -H, R⁹ is
 -CH₃, and R¹⁰ is -CH₃;
 The compound of Formula [I] wherein R¹ is
 - -OCH₃, R² is -C(O)H, R³ is -CH₂CH₃, R⁴ is -H, R⁵ is CH₃, R⁶ is CH₃, R⁷ is -CH₃, R⁸ is -H, R⁹ is -CH₃, and R¹⁰ is -CH₃;

 The compound of Formula [I] wherein R¹ is -OH,
 - The compound of Formula [I] wherein R¹ is -OH, R² is -C(O)H, R³ is -CH₃, R⁴ is -H, R⁵ is -CH₃, R⁶ is -CH₃, R⁷ is -CH₃, R⁸ is -H, R⁹ is -CH₃, and R¹⁰ is -CH₃;
 - The compound of Formula [I] wherein R^1 is -OH, R^2 is -C(O)H, R^3 is -CH₂CH₃, R^4 is -H, R^5 is CH₃, R^6 is CH₃, and R^7 is -CH₃, R^8 is -H, R^9 is -CH₃, and R^{10} is -CH₃;
 - The compound of Formula [I] wherein R¹ is -OH, R² is -C(O)H, R³ is -CH₃, R⁴ and R⁵, taken together, are -(CH₂)₂-, R⁶ is -CH₃, R⁷ is -H, R⁸ is -H, R⁹ is -CH₃, and R¹⁰ is -CH₃;
 - The compound of Formula [I] wherein R¹ is -OCH₃, R² is -C(O)H, R³ is -CH₃, R⁴ and R⁵, taken together, are -(CH₂)₂-, R⁶ is -CH₃, R⁷ is -H, R⁸ is -H, R⁹ is -CH₃, and R¹⁰ is -CH₃;
 - The compound of Formula [I] wherein R¹ is -OH, R² is -C(O)H, R³ is -CH₃, R⁴ is -H, R⁵ is -CH₃, R⁶ and R⁷, taken together, are -(CH₂)₃-, R⁸ is -H, R⁹ is -CH₃, and R¹⁰ is -CH₃;
 - The compound of Formula [I] wherein R¹ is -OCH₃, R² is -C(O)H, R³ is -CH₃, R⁴ is -H, R⁵ is -CH₃, R⁶ and R⁷, taken together, are -(CH₂)₃-, R⁸ is -H, R⁹ is -CH₃, and R¹⁰ is -CH₃;

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- The compound of Formula [I] wherein R¹ is
 -OCH₃, R² is -C(O)H, R³ is -CH₃, R⁴ is -H, R⁵ is
 -CH₃, R⁶ is -CH₃, R⁷ is -H, R⁸ is -CH₃, R⁹ is CH₃, and R¹⁰ is -CH₃;
- The compound of Formula [I] wherein R¹ is -OCH₃, R² is -C(O)H, R³ is -OCH₃, R⁴ is -H, R⁵ is -CH₃, R⁶ is -CH₃, R⁷ is -H, R⁸ is -H, R⁹ is -CH₃, and R¹⁰ is -CH₃;
- The compound of Formula [I] wherein R¹ is -OCH₃, R² is -C(O)H, R³ is -OCH₃, R⁴ is -H, R⁵ is -CH₃, R⁶ is -CH₃, R⁷ is -CH₃, R⁸ is -H, R⁹ is -CH₃ and R¹⁰ is -CH₃; and
- The compound of Formula [I] wherein R¹ is

 -OCH₃, R² is -H, R³ is -C(O)H, R⁴ is -H, R⁵ is

 -CH₃, R⁶ is -CH₃, R⁷ is -CH₃, R⁸ is -H, R⁹ is
 CH₃ and R¹⁰ is -CH₃.

Of the foregoing compounds, the most preferred compounds are as follows:

- The compound of Formula [I] wherein R¹ is

 -OCH₃, R² is -C(O)H, R³ is -CH₃, R⁴ is -H, R⁵ is

 -CH₃, R⁶ is -CH₃, R⁷ is -CH₃, R⁸ is -H, R⁹ is
 CH₃, and R¹⁰ is -CH₃;
- The compound of Formula [I] wherein R^1 is $-OCH_3$, R^2 is -C(O)H, R^3 is $-CH_3$, R^4 is -H, R^5 is $-CH_3$, R^6 is $-CH_3$, R^7 is -H, R^8 is $-CH_3$, R^9 is $-CH_3$, and R^{10} is $-CH_3$;
 - The compound of Formula [I] wherein R^1 is $-OCH_3$, R^2 is -C(O)H, R^3 is $-OCH_3$, R^4 is -H, R^5 is $-CH_3$, R^6 is $-CH_3$, R^7 is -H, R^9 is $-CH_3$, and R^{10} is $-CH_3$;
- The compound of Formula [I] wherein R¹ is

 -OCH₃, R² is -C(O)H, R³ is -OCH₃, R⁴ is -H, R⁵

 is -CH₃, R⁶ is -CH₃, R⁷ is -CH₃, R⁸ is -H, R⁹ is

 -CH₃ and R¹⁰ is -CH₃; and

The compound of Formula [I] wherein R^1 is $-OCH_3$, R^2 is -H, R^3 is -C(O)H, R^4 is -H, R^5 is $-CH_3$, R^6 is $-CH_3$, R^7 is $-CH_3$, R^8 is -H, R^9 is $-CH_3$ and R^{10} is $-CH_3$.

The novel alkyl tetralin aldehyde compounds of the present invention may be prepared in various fashions. In the preferable protocol, alkyl tetralins are first prepared. Then the alkyl tetralins are formylated (that is, the radical -C(O)H is added to the benzene ring of the tetralin structure, to form an alkyl tetralin aldehyde), or oxidized (that is, a -CH₃ substituent on the benzene ring of the tetralin structure is oxidized to -C(O)H, to form an alkyl tetralin aldehyde). Examples 1-4 illustrate specific methodology which may be utilized for the preparation of compounds of the present invention.

In general, alkyl tetralin compounds or alkyl tetralin aldehyde compounds may be prepared by numerous synthetic routes which will be readily apparent to those skilled in the art, once armed with the present disclosure.

- Examples of suitable methodology which may be employed or modified in accordance with the present disclosures to prepare compounds of the present invention include Frank, U.S. Patent Nos. 4,877,911, 4,877,914, 4,877,910, 4,877,916, 4,877,915, 4,877,913, 4,877,912, and 5,087,785, Carpenter,
- U.S. Patent No. 2,897,237, Carpenter, U.S. Patent No. 2,800,511, Fehr et al., U.S. Patent No. 5,162,588, Willis et al., U.S. Patent No. 4,605,778, Traas et al., U.S. Patent No. 4,352,748, Cobb et al., U.S. Patent No. 4,551,573, Wood, U.S. Patent No. 3,246,044, Wood et al., U.S. Patent No.
- 30 3,856,875, Sato et al., U.S. Patent No. 4,284,818, Kahn, U.S. Patent No. 3,379,785, Suzukamo et al., U.S. Patent No. 4,767,882, Gonzenbach, U.S. Patent No. 4,908,349, European Patent Application Publication No. 0 393 742, European Patent Application Publication No. 0 301 375, Japanese
- Patent No. SHO 57-40420, Fehr et al., Helv. Chim. Acta, Vol. 72, pp. 1537-1553 (1989), and Bedoukian, Paul Z., Perfumery and Flavoring Synthetics, 3rd ed., pp. 334-336, Allured

Publishing Corporation, Wheaton, IL (1986), the disclosures of each of which are hereby incorporated herein by reference, in their entirety.

In accordance with Frank, U.S. Patent No.

4,877,910, for example, various polyalkyl
tetrahydronapthalene compounds may be prepared by carrying
out a cyclialkylation reaction between an olefinic compound
and a substituted benzene compound in the presence of a

hydride abstracting reagent, an alkyl halide or hydrogen

halide, a Lewis acid, and, optionally, a phase transfer agent. Suitable olefinic compounds include 2,3-dimethyl-1-butene and 2,3-dimethyl-2-butene. Suitable substituted benzene compounds include isopropyl toluene (para-cymene), 1-ethyl-4-isopropylbenzene, 1-n-propyl-4-isopropyl-benzene,

and 1-tertiary-butyl-4-isopropyl-benzene. A suitable hydride abstracting reagent is 2,4,4-trimethyl-2-pentene (diisobutylene-2). Suitable alkyl halides include tertiary-butyl chloride, tertiary-amyl chloride, 2-methyl-2-chloropentane, 3-methyl-3-chloropentane and 1,8-dichloro-

20 para-menthane. Suitable Lewis acids include aluminum chloride, aluminum bromide, aluminum iodide, monofluorodichloroaluminum, monobromodichloroaluminum and monoiododichloroaluminum. Suitable phase transfer agents include methyltrioctylammonium chloride (referred to herein

as "MTOAc"), and a mixture of methyltrioctyl-ammonium chloride and methyltridecylammonium chloride (the mixture being marketed under the tradename Adogen-464 TM , by Sherex Co., located in Dublin, Ohio).

In general, the molar proportions of the reagents
employed in the foregoing process can be varied over a
relatively wide range. However, where phase transfer agents
are employed in the process, it is important, for the best
results, to maintain a ratio of less than one mole of phase
transfer agent per mole of Lewis acid. Preferably, the
molar ratio is about 0.8 to 1.0, more preferably 0.5 to 1.0,
phase transfer agent to Lewis acid. In addition, it is also
preferable to use a mixture of olefinic compound, hydride

abstracting reagent, alkyl halide and hydrogen halide, wherein these components are present in a molar range of about 1.0 to about 5.0 moles of olefin per mole of combined halides plus reagent. More preferably, the olefin, and the 5 combined halides plus reagent are present in nearly equimolar amounts, that is, about 1.0 mole of olefin per mole of combined halides plus reagent. Preferably, the substituted benzene compound is present in a range of about 0.5 to about 10 moles per mole of olefin, more preferably in 10 a range of about 0.5 to about 5.0 per mole of olefin. In a most preferred embodiment, each of the benzene compound, olefin, and the combination of alkyl halide, hydrogen halide plus hydride abstracting reagent, are present nearly in equimolar amounts, that is, about 1.0 mole of benzene 15 compound, to about 1.0 mole of olefin, to about 1.0 mole of combined halides plus hydride abstracting reagent. amount of Lewis acid utilized is preferably in the range of about 2% to about 10% by weight of the Lewis acid based on the combined weight of the substituted benzene, olefin, 20 alkyl halide, hydrogen halide plus hydride abstracting reagent.

The foregoing reaction is generally carried out using a solvent, although, if desired, substituted benzene, one of the starting materials, may be employed in large excess in lieu of an additional solvent. Suitable solvents include methylene chloride, chloroform, carbon tetrachloride, ethylene chloride, ethylidene chloride, 1,1,1-trichloroethane, 1,1,2-trichloroethane, 1,1,2,2-tetrachloroethane, 1,2-dichloroethylene, trichloro-ethylene, tetrachloroethylene, 1,2,3-trichloropropane, amyl chloride, ethylene bromide, monochlorobenzene, ortho-dichlorobenzene, bromobenzene, fluorobenzene, n-hexane, n-heptane, n-octane, benzene, toluene, ethylbenzene and xylene. Preferred for reasons of yield, safety and/or process engineering are the unhalogenated aliphatic and unhalogenated alicyclic hydrocarbons.

The alkylation reaction described above can be carried out in any suitable vessel which provides efficient contacting between the Lewis acid and the other reactants. For simplicity, a stirred batch reactor can be employed.

- Moreover, the reaction vessel used should be resistant to the possibly corrosive nature of the catalyst. Glass-lined vessels would be suitable for this purpose. Additional vessel materials will be apparent to those skilled in the art.
- The reagents of the present process may be added in any order, although where the process is carried out with a phase transfer agent, the preferred mode is to add the solvent, the Lewis acid and the phase transfer agent first, allow sufficient time for the Lewis acid to become

 15 substantially dissolved in the solvent, and then add the remaining reagents. Generally, 15 to 30 minutes are needed for the Lewis acid to become substantially dissolved in the solvent.

Ideally, the reaction is carried out at

temperatures ranging from about -30°C to about 50°C,
preferably at temperatures ranging from about -10°C to about
40°C, and most preferably at temperatures ranging from about
0°C to about 30°C.

The pressure at which the reaction is carried out
is not critical. If the reaction is carried out in a sealed
vessel, autogenous pressure is acceptable, although higher
or lower pressures, if desired, may be employed. The
reaction can also be carried out at atmospheric pressure in
an open reaction vessel, in which case the vessel is
preferably equipped with a moisture trap to prevent
significant exposure of Lewis acid to moisture. The
reaction can take place in an oxygen atmosphere, or an inert
atmosphere as in the presence of a gas such as nitrogen,
argon and the like, the type of atmosphere also not being
critical.

Reaction time is generally rather short and is often dictated by the kind of equipment employed.

Sufficient time must be provided, however, for thorough contacting of the substituted benzene compound, the olefinic compound, the Lewis acid and the phase transfer agent.

Generally the reaction proceeds to completion in about 1 to about 7 hours.

Product can be recovered by first quenching the reaction mixture in cold water or on crushed ice, preferably on ice, and then processing the mixture in the usual manner for Friedel-Crafts reactions to extract the desired alkyl-substituted tetrahydronaphthalene compounds. Suitable extraction protocol is described, for example, in Friedel-Crafts Reactions. Typically, following quenching and the resultant phase separation, the organic layer is washed an additional time with water to aid in removal of the Lewis acid. One or more additional washings can be carried out with dilute alkali solution to further aid Lewis acid removal. Pure product can then be recovered by subjecting the washed reaction mixture to reduced pressure fractional distillation.

Exemplary tetrahydronaphthalene compounds which may be prepared by the foregoing process include 1,1,3,4,4,6-hexamethyl-1,2,3,4-tetrahydronaphthalene (HMT), 6-ethyl-1,1,3,4,4-pentamethyl-1,2,3,4-tetrahydronaphthalene, 6-tertiary-butyl-1,1,3,4,4-pentamethyl-1,2,3,4-tetra
25 hydronaphthalene, and 6-n-propyl-1,1,3,4,4-pentamethyl-1,2,3,4-tetrahydro-naphthalene.

The disclosures of Frank, U.S. Patent No. 4,877,910, are hereby incorporated herein by reference in their entirety.

Alkyl tetralin compounds may then be formylated or oxidized to form alkyl tetralin aldehydes using conventional formylation or oxidation technology, as will be readily apparent to one skilled in the art once armed with the present disclosure.

Specifically, to prepare alkyl tetralin aldehydes from alkyl tetralins using formylation techniques, the alkyl tetralins are preferably reacted with α, α -dichloromethyl

methyl ether, in a solvent such as an organic solvent (preferably a halogenated organic solvent such as, for example, anhydrous methylene chloride), in the presence of a Lewis acid (preferably titanium tetrachloride). Other 5 suitable halogenated solvents and Lewis acids are described above, and will be readily apparent to those skilled in the art, once armed with the present disclosures. formylation methods are well known in the art, and are described in many of the patents and publications discussed 10 above for the preparation of alkyl tetralin compounds, as well as, for example, in Organic Syntheses, Collective Vol. 5, pp. 49-50, by A. Rieche, H. Gross, and E. Hoft, edited by H.E. Baumgarten, John Wiley and Sons (New York, NY 1973), Rahm, Synthetic Communications, Vol. 12, No. 6, pp. 485-487 15 (1982), Effenberger, Angewandte Chemie International Edition (English), Vol. 19, No. 3, pp. 151-230 (1980), Olah et al., Chemical Reviews, Vol. 87, No. 4, pp. 671-686 (1987), and Hauser et al., Synthesis, pp. 723-724 (August 1987), the disclosures of each of which are incorporated herein by 20 reference, in their entirety.

Alternatively, to prepare alkyl tetralin aldehydes from alkyl tetralins using oxidation techniques, the alkyl tetralins are preferably reacted with ceric ammonium nitrate (Ce(NO₃)₄•NH₄NO₃), a strong oxidant for organic compounds, in the presence of acetic acid. In general, these and other suitable oxidation methods are well known in the art, and are described, for example, in Syper, Tetrahedron Letters, No. 37, pp. 4493-4498 (1966), Laing et al., J. Chem. Soc. (C), pp. 2915-2918 (1968), Imamoto et al., Chemistry

Letters, pp. 1445-1446 (1990), Kreh et al., Tetrahedron Letters, Vol. 28, No. 10, pp. 1067-1068 (1987), Hauser et al., Communications, pp. 72-73 (August 1987), and Syper, Tetrahedron Letters, No. 42, pp. 4193-4198 (1967).

Further purification of the alkyl tetralin
aldehyde compounds of Formula [I] may be carried out, if
desired, using, for example, standard fractional
distillation techniques, as well as other conventional

- 14 -

extraction, distillation, crystallization and chromatography techniques, and the like.

Exemplary novel alkyl tetralin aldehyde compounds are shown in Table I below.

R10	-GH,	-CH,	Ġ,	-CH,	-CH3	-GH,	-GH3	-ĠH,	Ġ,	H,	H,	н.	H.		- <u>1</u> -	I.	Ţ.,	T
~) 		<u>ا</u>		۱۹	^೪	۲	۲	۲	-CH,	-CH ₃	Ę	-CH.	-CH,	-CH ₃	-GH,	-CH	
å	-ĊH,	-сн,сн,	-СН,	-CH ₃	-сн,сн,	-сн,	-CH3	#-	н-	-ĊH,	-сн,сн,	-СН,	-CH,	-CH2CH3	-СН,	-CH3	-н	:
P.	H-	H-	Ħ-	н-	н-	н-	н-	н-	н-	н-	н-	н-	-н	н-	н-	H-	н-	:
R,	н-	н-	Н-	н-	н,	н-	н-	Н-	н-	Н-	н-	н-	H,	н-	н-	H-	н-	1
å	-CH3	-CH3	-CH2CH3	-сн,	-CH3	-CH2CH3	-СН2СН3	-CH3	-сн,сн,	-CH,	-CH3	-СН2СН3	-CH ₃	-СН3	-сн2сн3	-CH2CH3	-CH3	CH.CH.
¥	H-	н-	н-	'HD-	•но-	-CH3	-CH3	-сн,	-CH3	н.	н-	Н-	-CH3	-СН3	-сн,	-CH3	-CH3	-CH
R*	н-	н-	н-	-н	н-	н-	н-	H-	н-	н-	н-	Н-	н-	н-	н-	н-	н-	н-
R³	-C (O) H	-с (о) н	-с(о)н	-с(о)н	-с (о) н	-с (о) н	-с(о)н	-C(0)H	-с(о)н	-с(о)н	-С(О)Н	н (о) э-	н (о) р-	-с(о)н	-C(O)H	-С(О)Н	-с(о)н	-C(O)H
, 8 ,	-осн	-осн,	-осн,	-OCH3	-0CH3	-OCH	-OCH3	-осн,	-осн,	-осн,	-осн,	-OCH,	-OCH	-OCH	-och,	-осн,	-OCH3	-OCH3
R1	-CH3	-CH3	-СН3	-Сн,	-CH3	-CH3	-Сн,	-СН,	-Сн,	-СН2СН3	-сн,сн,	-сн,сн,	-CH2CH3	-сн,сн,	-СН,СН,	-CH2CH3	-сн,сн,	-сн,сн,
Compound	1	2	3	4	S.	9	7	8	6	10	11	12	13	14	15	16	17	18

Compound	R	. 83	ra.	,	Z,	ž	'n,	M	R	R10
19	-сн,	но-	-с (о) н	Н-	н-	- CH,	н-	H-	-CH.	H.O
20	-сн,	но-	-С(О)Н	н-	Н-	-СН,	-н	#-	-CH.CH	ביים ביים
21	-CH3	но-	-С(О)Н	н-	H-	-CH2CH3	н-	-H	-CH.	- CH.
22	-CH ₃	но-	-с(о)н	#-	-сн,	-CH ₃	н-	н-	-CH,	j j
23	-сн3	но-	н (0) р-	н-	-CH3	-CH3	Н-	н-	-CH,CH,	GH,
24	-CH3	-он	н (о) э-	н-	-CH3	-CH2CH3	н-	н-	-CH,	, CH,
25	-CH3	но-	н (о) р-	н-	-СН3	-CH2CH3	μ-	н-	-CH,	, E,
26	-CH,	но-	н(о) э-	н-	-СН3	-CH3	H-	H-	Ħ-	CH.
27	-сн,	но-	-С(О)Н	Н-	-CH3	-сн,сн,	н-	н-	н-	E E
28	-CH2CH3	но-	-с(о)н	н-	н-	-CH3	н-	н-	-CH.	CH.
29	-CH2CH3	но-	-С(О)Н	н-	н-	-CH3	H-	н-	-CH.CH.	
30	-CH2CH3	но-	-С (О) Н	Н-	н-	-сн,сн,	H-	H-		
31	-CH2CH3	НО-	-C(O)H	н-	-CH3	-CH,	H-	H.	CH.	T. L.
32	-сн2сн3	но-	-С (О) Н	H-	-сн,	-CH3	H-	H-	-CH,CH.	S E
33	-CH2CH3	но-	-С (О) Н	н-	-СН,	-CH2CH3	H-	н-	THU -	[] E
34	-сн,сн,	но-	-С(О)Н	н-	-CH,	-CH2CH3	H-	H	Î H	
35	-сн,сн,	но-	-с (о) н	H-	-сн,	-СН,	н-	H-	F	
36 .	- CH2CH3	но-	-С(О)Н	н-	-CH3	-СН,СН,	H-	H-	H	
		_						_	-	

Compound	R1	R²	R³	R*	æ	Re	***	ž	ж	R10
37	-осн	-CH3	-с(о)н	Н-	н-	-CH3	н-	н-	-сн3	Ę.
38	-OCH3	-СН3	-с(о)н	-н	н-	-сн,	н-	н-	-СН2СН3	-CH ₃
39	-OCH3	-сн3	-С(О)Н	-Н	н-	-CH3	н-	-сн,	-CH3	-CH3
40	-OCH3	-CH3	-C(O)H	-Н	н-	-CH3	Н-	-СН3	-CH2CH3	-CH3
41	-OCH3	-CH3	-с(о)н	н-	н-	-CH3	н-	-сн2сн3	-CH3	-CH,
42	-OCH3	-CH3	-С(О)Н	н-	н-	-сн,	-СН3	н-	-Сн,	-СН,
43	-OCH3	-CH,	-с(о)н	н-	-н	-сн	-CH3	н-	-сн,сн,	-СН3
44	-осн	-CH3	-с(о)н	-Н	н-	-CH3	-CH3	-CH3	-СН3	-CH3
45	-осн,	-CH3	-с(о)н	н-	н-	-CH3	-CH3	-CH3	-сн,сн,	-CH3
46	-OCH	-CH,	-с(о)н	н-	н-	-CH3	-CH	-сн,сн,	-CH ₃	- CH3
47	-OCH3	-CH,	-с(о)н	н-	н-	-CH3	-СН2СН3	н-	-СН3	-CH3
48	-ocH ₃	-CH3	-с(о)н	н-	н-	-CH3	-сн,сн,	-CH3	-CH3	-CH ₃
49	-och	-сн,	-C(0)H	н-	н-	-сн,сн,	н-	Н-	-CH3	-сн3
50	-осн,	-сн,	-C(0)H	н-	н-	-CH2CH3	н-	-сн,	-CH3	-сн,
51	-осн,	-сн,	-C(0)H	Н-	н-	-CH2CH3	-CH3	н-	-CH3	-CH ₃
52	-осн	-CH,	-C(0)H	Н-	н-	- CH2CH3	-CH,	-сн3	-сн,	-CH,
53	-OCH3	-СН,	-С(О)Н	н-	-CH3	-CH3	н-	н-	-CH3	-CH3
54	-OCH3	-CH,	-С(0)Н	н-	-CH,	-СН3	н-	н-	-CH ₂ CH ₃	-CH3

Compound	R	R²	R³	R	Ř	å	, x	ğ	å	R10
55	-0CH3	-CH,	-с(о)н	Н-	-сн,	-CH3	н-	-GH,	-GB,	-6#,
56	-OCH ₃	-CH3	н (о) р-	н-	-CH ₃	-G	H-	-CH3	-CH2CH3	-Сн,
57	-OCH	-CH3	н (о) а-	н-	-сн3	-CH3	н-	-CH2CH3	-сн,	-СН,
58	-OCH3	-CH,	-с(о)н	н-	-CH3	-CH3	-CH3	н-	-CH3	-CH,
59	-осн,	-сн,	-с(о)н	н-	-CH3	-CH3	-СН,	н-	-CH2CH3	-CH3
09	-OCH,	-сн,	-с(о)н	н-	-CH3	-CH3	-CH,	-сн,	-СН,	-CH3
61	-0CH3	-CH3	-с(о)н	н-	-CH3	-CH	-CH3	-CH,	-CH2CH3	-CH,
62	-осн	-CH,	-с(о)н	н-	-СН3	-Сн3	- CH3	-СН,СН,	-CH,	-СН,
63	-осн3	-CH3	-с(о)н	н-	-CH3	-CH,	-СН2СН3	н-	-CH,	-CH,
64	-осн,	-CH3	-C(0)H	н-	-CH3	-CH,	-CH2CH3	-CH,	-CH3	-CH,
65	-осн,	-СН,	-с(о)н	н-	-СН,	-сн,сн,	н-	н-	-сн,	-CH,
99.	-осн,	-CH3	-с(о)н	н-	-CH ₃	-CH2CH3	н-	-CH3	-СН,	-СН,
67	-осн,	-сн,	-C(0)H	н-	-сн,	-СН2СН3	-СН,	н-	-CH3	-CH,
89	-OCH,	-CH,	-с(о)н	н-	-CH3	-СН2СН3	-CH3	-CH,	-ĊH,	-СН,
69	-осн	-Сн,	-с(о)н	н-	-CH3	-сн,сн,	H-	#-	-CH,	-CH3
70	-0CH ₃	-СН3	-с(о)н	н-	-СН3	-сн,сн,	Ŧ	-СН3	-CH,	-СН,
7.1	-осн,	-СН,	-C(0)H	н-	-СН,	-CH2CH3	-CH3	н-	-CH,	-CH3
72	-осн3	-CH ₃	-с(о)н	н-	-CH,	-СН,СН,	-CH3	-CH3	-CH,	-ĠĦ,

	χ. 5	- CH	H.J	-CH.	H.J	Į,	T 2		T H	-CH.	7	5		-CH3		E E	-C.E.3		į
	ê	н-	н-	н-	н-	н-	Η-	H	н-	H-	#	#	: 5	: 2	HJ-HJ-		E 10 10 10 10 10 10 10 10 10 10 10 10 10	[ŧ
	ů.	н-	н-	-CH,	-CH,	-Сн,сн,	H-	H-	-СН,	-CH,	-CH,CH,	, H-	H.	F H	H-	-CH.	L L		ב ב
	R7	Н-	H-	н-	н-	H-	-CH,	-CH,	-Сн,	-CH3	ĠĦ,	-СН,СН,	CH,CH.	H	H-	H-	Н-	-	-
	å	-СН3	-СН2СН3	-CH,	-сн,сн,	-CH3	-CH3	-СН2СН3	-CH,	-СН,СН,	-CH ₃	-CH ₃	Ę.	-CH,	-сн,	-CH,	-сн,	ŧ	ָרָב <u>ּי</u>
	R³	-сн3	-CH,	-CH3	-CH ₃	-CH,	-CH,	-CH3	-СН,	-CH ₃	-СН,	-СН,	-CH3	H-	H-	н-	H-	n	-
	.	н-	Н-	н-	н-	н-	H-	н-	н-	н-	н-	H-	H-	-H	Н-	н-	-н	H	-
	ж.	-с(о)н	-с(о)н	н(о) р-	-с (о) н	н(о) л-	-С(О)Н	-С (О) Н	-с(о)н	-с(о)н	-с(о)н	-с (о) н	н(о) э-	н (о) р-	-с(о)н	-C(O)H	-С(0) Н	-С(0) Н	-
	¥	-CH3	-CH3	-СН3	-СН3	-сн,	-сн,	-CH ₃	-СН3	-СН3	-сн, -	-Сн,	-CH ₃	сн,сн,	-CH2CH3 -	-СН2СН3 -(-СН2СН3 -(-СН2СН, -С	
10		-осн,	-0CH ₃	-осн,	-och,	-осн,	-och,	-och,	-осн,	-осн,	-осн,	-осн,	-осн ₃	-0CH ₃	-0CH ₃ -(-ОСН	-осн, -с	-осн, -с	
Compound		73	74	75	. 92	- 77	- 82	- 62	80	81	82	83	84	85 -(98	87 -0	D- 88	O- 68	_

Compound	R ¹	8 3	£X.	, 4	×	ĸ	æ	ů.	۵	R10
91	- OCH3	-сн2сн3	н (о) а-	-Н	н-	-сн,	-сн	н-	-CH,CH,	-CH,
92	-0CH3	-сн,сн,	-с(о)н	-H	н-	-сн,	-CH3	-СН,	-CH3	-CH3
93	-0CH ₃	-CH2CH3	-с(о)н	н-	н-	-CH3	-CH3	-CH3	-СН2СН3	-CH ₃
94	-осн,	-сн,сн,	-С(О)Н	-н	н-	-CH3	-CH3	-сн,сн,	-CH3	-CH3
95	-осн,	-сн,сн,	-с(о)н	-Н	н-	-CH	-CH2CH3	н-	-CH,	-CH3
96	-осн,	-сн,сн,	-с(о)н	-Н	н-	-CH3	-CH2CH3	-CH3	-CH3	-сн,
97	-осн	-сн2сн3	-с(о)н	-Н	н-	-CH2CH3	н-	н-	-сн,	-CH3
86	-0CH3	-сн,сн,	-C(O)H	н-	н-	-сн2сн3	н-	-сн,	-сн,	-Сн,
66	-OCH3	-CH2CH3	-C(O)H	н-	-н	-сн2сн3	-сн,	н-	-СН3	-сн,
100	-осн	-сн,сн,	-с(о)н	н-	н-	-сн2сн3	-CH3	-CH,	-CH3	-СН3
101	-осн	-сн,сн,	-с(о)н	н-	- CH3	-CH3	н-	н-	-CH3	-CH3
102	-осн,	-сн,сн,	-с(о)н	н-	-CH3	-CH3	н-	н-	-CH2CH3	-CH3
103	-och	-сн,сн,	-с(о)н	н-	- CH3	-CH3	н-	-сн,	-CH3	-CH3
104	-och	-сн,сн,	-С(О)Н	н-	-сн,	-CH3	н-	-СН,	-сн2сн,	-СН3
105	-0CH3	-сн2сн3	-с(о)н	-Н	-СН3	-CH3	н-	-CH2CH3	-CH3	-СН3
106	-och	-сн2сн3	-С(0)Н	-Н	-сн3	-CH3	-CH3	н-	-CH3	-CH3
107	-OCH3	-сн,сн,	-C(0)H	-Н	-CH3	-сн,	-CH3	H-	-сн,сн,	-CH3
108	-OCH3	-сн,сн,	-с (о) н	н-	-CH3	-сн3	-CH3	-CH3	-CH,	-сн,

		٦	ا س		Τ.		Π.	T.	Τ.	T_{\perp}	T		Ţ	7	T		Τ	Τ	T
610		3	-CH	-CH ₃	Ą	Ę	Ę	Ð	Ę	Ç.	[] H	ָרָין קיין	ָּבָּין ק	Į į	Ť	Î Ħ	` E	֟֞֟֞֟֓֟֟֟֓֟֓֟֓֟֓֓֟֟֟֓֟֓֓֟֟֓֟֓֟֟֓֓֟֟֓֓֟֟	Į Ę
	2 2		-CH3	-CH3	-CH3	-CH3	-CH,	-CH,	Ę.	-CH,	-CH.	-CH.	CH.	F-	Н-	н-	#-	H-	#
å	# <u>.</u>		-CH2CH3	H-	-сн,	н-	-СН,	н-	-GH,	н-	-CH,	H-	-CH,	-н	н-	-СН,	-CH,	-сн,сн,	- F
κ,	- CH,	` E	Cin)	-CH2CH3	-CH2CH3	н-	н-	-CH,	-CH3	н-	H-	-сн,	-CH,	H-	H-	н-	H-	H-	-CH3
Ré	-Сн,	- CH.		-CH3	-CH3	-СН,СН,	-CH2CH3	-CH2CH3	-сн,сн,	-сн,сн,	-CH2CH3	-CH2CH3	-СН2СН3	-CH3	-CH2CH3	-CH3	-СН,СН,	-CH,	-CH ₃
RS	-Сн,	-CH.		-CH3	-CH3	-CH3	-CH3	-CH3	-CH3	-CH3	-CH3	-CH,	-СН,	-CH3	-CH3	-СН,	-СН,	-CH ₃	-CH3
,	н-	н-		н-	н-	н-	н-	н-	н-	н-	н-	H-	H-	H-	н-	н-	н-	н-	н-
ĸ	-с (о) н	-C(0)H		-С (О) Н	-с (о) н	-C(O)H	н (о) л-	-с(о)н	-C(0)H	-С(0) Н	-С(О)Н	-С(О)Н	-С(О)Н	-С(О)Н	-с(о)н	-с(о)н	-С(0)Н	-C(0)H	-C(O)H
R ²	-CH2CH3	-СН2СН3		-сн,сн,	-СН2СН3	-CH2CH3	-CH2CH1	-сн2сн3	-Сн2СН,	-сн,сн,	-сн,сн,	-СН2СН3	-сн,сн,	-CH2CH1	-сн,сн,	-СН2СН3	-сн,сн,	-CH2CH3	-сн,сн,
R	-OCH	-ocH ₃		-OCH ₃	-och,	-OCH	-осн,	-OCH3	-OCH3	-OCH3	-осн,	-осн,	-осн,	-och	-och,	-осн,	-осн,	-осн	-осн ₃
Compound	109	110	7	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126

127 OCR4, CTG/10H CTG/	Compound		R ²	R³	,	ķ	Ré	14	R	B.	Rio
0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 -		-осн	-сн,сн,	н (о) э-	Н-	-СН,	-СН2СН3	-CH3	H-	Н-	, £
9 -CCH, -CC		-0CH3	-сн,сн,	н (о) р-	н-	-сн,	-сн,	-сн,	-CH3	н-	Ę,
0 -OCH3 -CH5CH3 -CF(0)H -H -CH3 -CH3 -CH3, T -H -H -H -CH3, T -CH3, T -C	6	-осн	-сн,сн,	н (о) э-	н-	-сн,	-CH2CH3	-CH3	-CH,	н-	-GH,
1 -OCH, -CH,CH, -C(O)H -H -CH, -CH, -CH,CH, -C(O)H -CH, -CH, -CH,CH,		-осн,	-сн2сн3	-С(О)Н	н-	-сн,	-CH3	-СН,	-CH2CH3	H-	-CH,
2 -OCH3 -CF(0)H -H -CF4	-	-осн,	-сн,сн,	-с(о)н	н-	-СН3	-CH3	-СН2СН3	н-	H-	-CH3
4 -OCH4 -C(O)H -H -CH4 -	2	-och,	-сн,сн,	-с(о)н	н-	-сн3	-CH3	-СН,СН,	-CH,	H-	-CH,
4 -OCH4 -C (O)H -H -CH3	8	-och	-осн,	-с(о)н	н-	н-	-CH3	н-	н-	-СН3	-сн,
5 -OCH, -C(0)H -H -H -CH, -CH	4	-осн,	-осн	-C(O)H	н-	н-	-CH3	н-	н-	-CH2CH3	-CH3
i -OCH, -C (O) H -H -CH, -CH, <th< td=""><td>5</td><td>-осн,</td><td>-осн,</td><td>-с(о)н</td><td>н-</td><td>Н-</td><td>-CH3</td><td>H-</td><td>-CH3</td><td>-CH3</td><td>-CH,</td></th<>	5	-осн,	-осн,	-с(о)н	н-	Н-	-CH3	H-	-CH3	-CH3	-CH,
-OCH, -OCH, -C (O)H -H -H -CH, -CH, <t< td=""><td>9</td><td>-OCH₃</td><td>-OCH</td><td>-С(о)н</td><td>н-</td><td>н-</td><td>-сн,</td><td>н-</td><td>-CH3</td><td>-CH2CH3</td><td>-Сн,</td></t<>	9	-OCH ₃	-OCH	-С(о)н	н-	н-	-сн,	н-	-CH3	-CH2CH3	-Сн,
- OCH ₃ - OCH ₃ - C(0)H - H - H - CH ₃ - CH ₃ - CH ₃ - CH ₃ - C(1)H - H - H - CH ₃ - CH ₃ - CH ₃ - CH ₃ - C(1)H - H - H - CH ₃ - CCH ₃ - CCCH ₃ - CCH	7	-ОСН,	-OCH3	-С(О)Н	н-	Н-	-CH3	н-	-СН,СН,	-CH,	-CH3
- OCH ₃ - OCH ₃ - C(0)H - H - H - CH ₃ - C(0)H - H - H - CH ₃ - CH	80	-осн,	-осн,	-C(0)H	н-	н-	-CH3	-CH3	н-	-CH3	-CH,
-OCH ₃ -OCH ₄ -C(O)H -H -H -CH ₃ -CCH ₃ -C(O)H -H -H -CH ₃ -CCH ₃ -CC	6	-осн,	-осн,	-С(0)Н	н-	н-	-CH,	-CH,	н-	-СН2СН3	-CH3
-OCH, -OCH, -C (O) H -H -H -CH, -CH, -CH, -CH, -CH, -CH, -	0	-осн,	-осн,	-С(О)Н	н-	н-	-CH3	-СН,	-СН3	-CH,	-CH ₃
-OCH, OCH, -OCH, -C(O)H -H -H -CH, -CH, -CH, -CH, -CH, CH, -CH, CH, -CH, -		-осн,	-OCH,	-с(о)н	Н-	н-	-СН,	-CH3	-CH3	-сн,сн,	-СН,
-OCH ₃ -OCH ₃ -C(O)H -H -H -CH ₃ -CH ₂ H-CH ₃ -CH ₃ -H -CH ₃ -CH		-осн,	-och	-с(о)н	н-	н-	-СН,	-CH3	-СН,СН,	-CH,	-CH,
-OCH, -OCH, -C(O)H -H -H -CH, -CH, -CH, -CH,		-осн,	-OCH3	-с(о)н	н-	H-	-CH3	-CH ₂ CH ₃	H-	-CH,	-ĠĦ,
		-OCH3	-OCH3	-с(о)н	н-	н-	-CH3	-CH2CH,	-GH,	-Сн,	-CH,

				T		T	T	T	T	T		7	T	T	T	T	T	T
R10	- E)-	, F	Ġ,	-CH,	Ę,	-CH3	-CH ₃	-GH ₃	-CH3	-CH3	, HD	-CH,	-CH,	Ę.	-CH3	-ĠĦ,	-CH,	Ę
Ŗ	-ੰਜ਼,	-CH3	-СН,	-CH,	-CH,	-CH2CH3	-сн,	-CH2CH3	-СН,	-CH3	-СН,СН,	-CH3	-CH2CH3	-CH3	-сн,	-CH3	-CH3	-СН,
Re	н-	-CH3	н-	-CH,	н-	н-	-сн,	-CH3	-CH2CH3	н-	н-	-CH3	-CH ₃	-CH2CH3	#-	-CH,	#-	-сн,
E,	H-	H	-CH,	-CH,	н-	н-	н-	н-	н-	-СН,	-CH3	-CH3	-сн,	-СН,	-СН2СН,	-СН2СН3	н-	#
å	-сн2сн3	-CH2CH3	-CH2CH3	-СН2СН	-CH3	-Сн3	-CH3	-CH3	-CH3	-CH3	-CH ₃	-CH3	-CH ₃	-CH3	-CH3	-CH,	-сн,сн,	-CH2CH3
å	Н-	н-	н-	н-	-сн,	-CH3	-CH3	-CH,	-сн,	-СН,	-СН,	-CH3	-сн	-CH3	-CH,	-CH3	-Сн,	-CH3
å	н-	н-	н-	н-	н-	н-	н-	н-	н-	н-	н-	н-	н-	н-	н-	н-	н-	н-
R3	н (о) р-	-с(о)н	-с(о)н	н (о) а-	-с(о)н	-С(О)Н	-с(о)н	-с(о)н	-с(о)н	-с(о)н	-с(о)н	-с(о)н	-с(о)н	-С(0)Н	-с (о) н	-С(О)Н	-С(О)Н	-С(0)н
ж3	-0CH ₃	-осн	-осн,	-OCH	-осн	-осн	-OCH3	-OCH3	-осн,	-OCH ₁	-OCH3	-осн,	-осн,	-OCH	-осн,	-OCH,	-осн,	-осн,
₽ 1	[€] НДО	-OCH ₃	-och,	-осн,	-OCH3	-осн3	-осн,	-OCH3	-OCH ₃	-0CH ₃	-OCH3	-осн	-осн,	-OCH ₃	-осн,	-OCH,	-осн	-осн,
Compound	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162

R10	-сн,	-CH,	-CH3	-СН,	-CH,	-CH3	-CH3	-CH,	-сн,	-CH,	-CH3	-сн,	-CH3	-CH,	-CH,	-CH,	-CH,	-
å	-CH,	-СН,	-CH ₃	-CH,	-GH,	-CH,	Н-	H-	н-	н-	н-	Н-	H-	H-	Н-	H-	н-	
ž.	H-	-GH,	н-	-CH3	н-	-СН,	н-	н-	-CH ₃	-CH ₃	-CH2CH3	н-	н-	-CH3	-CH3	-сн,сн,	н-	
'n	-Сн,	-CH3	н-	н-	- CH3	-CH3	н-	Н-	н-	н-	н-	-CH3	-CH3	-СН,	-CH3	-CH3	-СН,СН,	
æ	-CH2CH3	-CH2CH3	- CH2CH3	-CH2CH3	-сн,сн,	-сн,сн,	-CH3	-CH2CH3	-СН,	-сн2сн,	-CH ₃	-СН,	-СН2СН3	-CH3	-CH2CH,	-CH3	-СН3	
: #	-CH3	-СН3	-CH3	-СН,	-СН,	-CH,	-сн,	-CH3	-Сн,	-CH3	-сн,	-СН,	-CH3	-CH,	-СН,	-сн3	-СН3	
π.	н-	н-	н-	н-	н-	н-	н-	н-	н-	н-	Н-	н-	Н-	н-	н-	н-	н-	
R³	-с(о)н	н (о) э-	-с(о)н	-с (о) н	-с(о)н	-C(0)H	н (о) р-	н (о) э-	-С(О)Н	н (о) э-	-с (о) н	-с(о)н	-с(о)н	-с (о) н	-C(0)H	-с(о)н	+C(0)H	
ж,	-0CH3	-0CH _{3.}	-осн,	-осн,	-OCH ₃	-OCH3	-OCH3	-och3	-осн,	-осн	-OCH3	-OCH3	-0CH ₃	-OCH3	-осн,	-0CH3	-осн,	
R¹	-OCH	-осн,	-осн,	-осн,	-och	-осн3	-och,	-осн,	-0CH3	-OCH3	-осн	-осн,	-OCH,	-och3	-осн,	-осн,	-осн,	
Compound	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	_

•										
compound	, a	ž	R.	R*	.	Re	`k	Î.	â	R ¹⁰
181	-ОН	-сн,	-с(о)н	н-	н-	-CH3	н-	н-	-Сн,	-CH.
182	-ОН	-сн	-C(0)H	н-	н-	-CH3	H-	Ħ	-CH,CH.	, H.
183	но-	-сн,	н (о) э-	H-	H-	-GH,	H-	-GH,	-CH.	(ii)
184	но-	-сн,	-с(о)н	н-	H-	-CH,	н-	Ë	-CH.CH.	#D-
185	но-	-CH ₃	-с(о)н	н-	Н-	-CH3	н-	-CH,CH,	-CH.	H.J.
186	но-	-СН3	-с(о)н	н-	H-	-СН3	-сн,	, H-	-GH.	H.) -
187	но-	-СН,	-С(О)Н	н-	н-	-СН,	-CH3	н-	-CH,CH,	
188	но-	-сн,	-С(О)Н	н-	н-	-CH,	-CH3	-СН3	-CH,	-CH,
189	но-	-CH3	-C(0)H	н-	н-	-CH3	-CH3	-CH ₃	-CH,CH,	-CH.
190	но-	-сн,	-C(0)H	н-	Ħ,	-CH,	-СН,	-Сн,сн,	, E	, H
191	но-	-CH3	-C(O)H	H-	H-	-CH ₃	-СН,СН,	, н	, H.	
192	но-	-CH3	-С(О)Н	н-	#-	-CH.	מול מולי			(III)
193	но-	-CH,	-C(0)H	н-	H	-CH,CH.	Cm2Cm3	-ca ₃	£ .	Ęį l
194	но-	-СН,	-C(O)H	н-	Н-	-CH,CH.	; #	: }	Ę.	-CH3
195	но-	-CH3	-C(0)H	H-	H-	-Сн,сн,	-CH.	1 n	f. 5	- CH3
196	HO-	-CH ₃	-C(0)H	H-	H-	-Сн.сн.	1 5	; =		- CH ₃
197	но-	-CH ₃	-с(о)н	H-	-CH,	-CH,	H-	in in	- CH ₃	Ę į
198	HO-	-CH,	H(0) D-	H-	-CH.	,	: :	: :	-(a ₃	E.
					[:::]			H	-CH2CH3	-CH ₃

Compoduia	R*	R 3	R	R*	ž	å	,x	Rå	R,	, K10
199	но-	-CH3	н (о) э-	Н-	-CH3	-сн3	н-	-Сн,	-CH3	-сн,
200	но-	-сн,	-с(о)н	н-	-CH3	-CH3	н-	-СН,	-CH2CH3	-CH3
201	но-	-сн,	-с(о)н	н-	-CH,	-CH3	н-	-СН,СН,	-СН,	-GH3
202	но-	-CH3	-с(о)н	н-	-CH3	-CH3	-СН,	н-	-СН,	-GH3
203	но-	-сн,	-С(О)Н	Н-	-сн,	-СН3	-сн,	н-	-сн2сн,	-CH,
204	но-	-сн,	-с(о)н	н-	-СН3	-сн,	-CH,	-СН3	-СН,	-CH3
205	но-	-сн,	-с(о)н	Н-	-CH3	-сн	-CH3	-СН,	-СН2СН3	-CH3
206	но-	-сн,	-С(О)Н	-Н	-CH3	-CH3	-СН,	-СН2СН3	-СН,	-CH3
207	но-	-CH3	-с(о)н	н-	-CH3	-CH3	-CH2CH3	н-	-CH,	-CH3
208	но-	-CH,	-с(о)н	н-	-CH3	-CH3	-CH2CH3	-СН,	-СН,	-CH3
209	но-	-СН,	-C(0)H	н-	-сн,	-CH2CH3	Н-	Н-	-СН,	-CH,
210	но-	-СН,	-C (O) H	μ-	-CH3	-сн,сн,	н-	-CH,	-СН,	-CH,
211	но-	-СН,	-C(0)H	H-	-CH3	-CH2CH3	-CH3	н-	-CH3	-CH,
212	но-	-сн,	-C(0)H	-н	-сн,	-CH2CH3	-CH ₃	-CH3	-CH3	-CH,
213	но-	-сн,	-С(0)Н	Н-	-сн,	-CH2CH3	н-	н-	-CH3	-CH3
214	но-	-сн,	-с(о)н	-Н	-сн3	-CH2CH3	н-	-CH3	-CH,	-CH3
215	но-	-сн,	-с(о)н	-Н	-сн3	-CH2CH3	-CH3	н-	-СН,	-СН,
216	но-	-СН3	-с(о)н	-Н	-CH,	-CH2CH3	-CH3	-CH3	-СН,	-сн,

	R10	-CH.			[H]	H.)	E 2	H.	בין	(II)		(H3)	(H)	-CH3	-CH ₃	-CH,	-сн,	-CH,	
i	R.	Н-	a	: 1	: #	: =	; ;	: H		, : H	# # # # # # # # # # # # # # # # # # #	: 5	; ;	+	\dashv	<u>_</u>	+		H
		H	н-	H.	j j	-CH,CH,	H	H-	-CH.	Ę,	-CH,CH,	F H	: ;	[H]	_	+	+	+	-cn ₂ cn ₃
	R)	-н	H-	н-	#	н-	-Сн,	-CH ₃	-Сн,	-CH,	-CH,	+-	, no no	(m) (m)	# h	: 2	1 1	+	-
	,X	-CH,	-CH ₂ CH ₁	-CH,	-CH2CH3	-CH3	-CH3	-CH2CH3	-CH,	-CH2CH3	-CH ₃	-СН,	, E	1 HZ	E. F.	-CH.	H.D	ָבָּרָ בַּי	
	R\$	-CH3	-CH3	-CH3	-ĊĦ,	-CH,	-CH3	-СН3	-CH3	-СН,	ĠĦ,	-CH3	-CH,	, H	H	Н-	H-	н-	
	,	н-	H-	H-	н-	н-	H-	н-	н-	н-	н-	н-	H-	н-	H-	H-	H,	H	
	R³	-с(о)н	-C(O)H	-С(О)Н	-C(0)H	-с (о) н	-C(0)H	-С(О)Н	-С(О)Н	-С(О)Н	-C(0)H	-C(O)H	-C(0)H	-C(O)H	-C(O)H	-C(0)H	-C(O)H	-C(0)H	
	R²	-CH3	-CH3	-CH3	-СН,	-СН,	-CH3	-СН3	-CH3	-СН3	-сн,	-СН,	-CH3	-CH2CH3	-сн,сн,	-CH2CH3	-СН,СН,	-CH2CH3	
	R1	но-	но-	но-	но-	но-	но-	но-	но-	но-	но-	но-	но-	но-	но-	но-	но-	НО-	;
	Compound	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	23.4

Compound	Rt	R³	ę w	R.	***	¥.	. **	»,	æ	R10
235	но-	-CH2CH3	-c(o)H	н-	н-	-CH3	-сн3	Н-	- ਦਸ਼,ਦਸ਼,	-GB,
236	но-	-сн,сн,	-с(о)н	н-	н-	-сн,	-CH3	-сн	-СН,	-СН,
237	но-	-сн,сн,	-с(о)н	н-	н-	-сн3	-СН3	-CH3	-CH2CH3	-CH3
238	но-	-сн,сн,	-с(о)н	н-	н-	-CH,	-CH3	-сн,сн,	-CH3	-CH3
239	но-	-сн,сн,	-с(о)н	н-	н-	-CH3	-CH2CH3	н-	-сн	-CH3
240	но-	-сн,сн,	-с(о)н	н-	н-	-CH3	-сн,сн,	-CH3	-CH3	-CH3
241	но-	-сн,сн,	-с(о)н	н-	н-	-CH2CH3	Н-	н-	-CH3	-CH,
242	но-	-CH2CH3	н (о) а-	. н-	н-	-Сн2СН3	Н-	-CH3	-СН,	-CH3
243	но-	-CH2CH3	н (о) э-	н-	н-	-CH2CH3	-CH3	н-	-СН,	-CH ₃
244	но-	-сн,сн,	-С(О)Н	н-	н-	-CH2CH3	-CH3	-CH3	-CH,	-СН,
245	но-	-сн,сн,	-С(О)Н	н-	- CH3	-CH3	н-	н-	-CH3	-СН,
246	но-	-сн,сн,	-с(о)н	н-	-CH3	-CH3	Щ.	н-	-СН2СН3	-СН,
247	но-	-СН2СН3	-с(о)н	н-	-сн,	-CH3	#-	-CH3	-CH,	-СН,
248	но-	-сн2сн,	-с(о)н	н-	-CH3	-CH3	Н-	-CH3	-СН,СН,	-CH3
249	но-	-CH2CH3	-с(о)н	н-	-CH3	-CH3	н-	-сн,сн,	-CH3	-CH3
250	но-	-сн,сн,	-с(о)н	н-	-CH3	-СН3	-CH3	н-	-CH,	-СН,
251	но-	-сн,сн,	-с(о)н	н-	-CH3	-СН,	-CH3	н-	-CH2CH3	-CH3
252	но-	-сн,сн,	-с(о)н	н-	-сн,	-СН3	-СН3	-CH3	-CH3	-CH ₃

253 -0H -CH,CH	Compound	R	8 3	R³	R.	RS	ř	æ	å	₽	R10
4 -OH -CH3CH, -C(O)H -H -CH3,	253	но-	-CH2CH1	-С(0)Н	Н-	-CH3	-@,	-CH3	-сн,	-CH2CH3	-СН,
5 -OH -CH,CH, -C(O)H -H -CH, -CH,CH, -C(O)H -H -CH,CH, -CH,CH, -C(O)H -H -CH,CH, -CH,	254	но-	-сн2сн3	н (о) э-	н-	-CH3	-сн,	-сн3	-сн2сн3	-CH3	, CH,
6 -OH -CH,CH -CH,H -CH,H -CH,H -CH,H -CH,CH -CH,CH,H -C(O)H -H -CH,CH,H -CH,CH,H -C(O)H -H -CH,CH,H	255	но-	-CH2CH3	н (о) р-	н-	-CH3	-CH3	-CH2CH3	H-	-CH3	-CH,
7 -0H -CH,CH,CH,CH,CH,CH,CH,CH,CH,CH,CH,CH,CH,C	256	но-	-сн2сн,	-С(О)Н	н-	-CH3	-СН,	-сн,сн,	-CH3	-CH3	-CH3
6 -OH -CH ₃ CH ₃ -C(0)H -H -CH ₃ CH ₃ -CH ₃ CH ₃ -C(0)H -H -CH ₃ CH ₃ -CH ₃ CH ₃ -C(0)H -H -CH ₃ CH ₃	257	но-	-сн2сн3	-С(О)Н	н-	-сн	-CH2CH3	н-	-н	-CH3	-CH3
9 -0H -CH ₃ CH ₃ -C(0)H -H -CH ₃ CH ₃	258	но-	-CH2CH3	-с(о)н	н-	-CH3	-СН2СН3	н-	-CH,	-CH3	-Сн,
0 -OH -CH3CH3 -CH3 -CH3CH3 -CH3CH3 <td>259</td> <td>но-</td> <td>-сн,сн,</td> <td>-с(о)н</td> <td>н-</td> <td>-CH3</td> <td>-сн,сн,</td> <td>-CH3</td> <td>н-</td> <td>-СН,</td> <td>-CH3</td>	259	но-	-сн,сн,	-с(о)н	н-	-CH3	-сн,сн,	-CH3	н-	-СН,	-CH3
1 -OH -CH ₂ CH ₃ -C(0)H -H -CH ₃ -CH ₂ CH ₃ -CH ₂ CH ₃ -CH ₃ CH ₄ -	260	но-	-сн,сн,	-с(о)н	н-	-CH3	-CH2CH3	-CH3	-СН,	-CH,	-CH,
0 -OH -CH ₂ CH ₃ -C(0)H -H -CH ₃ CH ₄ -CH ₃ CH ₄ -C(0)H -H -CH ₃ CH ₄	261	но-	-CH2CH3	-с(о)н	н-	-CH3	-CH2CH3	H-	H-	-CH,	-Сн,
1 -OH -CH ₂ CH ₃ -C(O)H -H -CH ₃ CH ₄ -C(O)H -H -CH ₃ CH ₄ -C(O)H -H -CH ₃ CH ₄	262	но-	-сн,сн,	н (о) э-	н-	-CH3	-СН2СН3	Н-	-CH3	-CH,	-CH,
-OH -CH ₂ CH ₃ -C(0)H -H -CH ₃ CH ₃ -CH ₃ CH ₄ -C(0)H -H -CH ₃ CH ₄	263	-ОН	-сн,сн,	-с(о)н	н-	-CH3	-CH2CH3	-CH3	н-	-СН,	-СН,
-OH -CH ₂ CH ₃ -C (O) H -H -CH ₃ -CH ₃ -H -CH ₃ -CH ₃ -H -CH ₃ -CH ₃ -H -H -CH ₃ -H -H -CH ₃ -H	264	но-	-сн,сн,	-с(о)н	Н-	-CH3	-CH2CH,	-CH ₃	-CH,	-GH,	-CH,
-OH -CH ₂ CH ₃ -C (O) H -H -CH ₃ -CH ₂ CH ₃ -H -CH ₃ CH ₃ -H -CH ₃ CH ₃ -H -CH ₃ -H	265	но-	-сн2сн,	-с(о)н	н-	-CH3	-CH3	н-	H-	н-	-Сн,
-OH -CH ₂ CH ₃ -C(O)H -H -CH ₃ -CH ₃ -CH ₃ -H -CH ₃ -CH ₃ -H -CH ₃	266	но-	-CH2CH3	-с(о)н	н-	-CH,	-СН2СН3	H-	#-	H-	-CH,
-OH -CH ₂ CH ₃ -C(O)H -H -CH ₃ -CH ₃ CH ₃ -H -CH ₃ -H -CH ₃ -H -CH ₃ CH ₃ -H -CH ₂ CH ₃ -H -CH ₂ CH ₃ -H -CH ₃ CH ₃ -CH	267	но-	-сн,сн,	-с(о)н	H-	-CH,	-CH3	#-	-CH3	H-	-Сн,
-OH -CH ₂ CH ₃ -C(0)H -H -CH ₃ -CH ₃ -H -CH ₃ -	268	HO-		-с(о)н	н-	-CH3	-сн,сн,	н-	-CH3	H-	-CH3
-ОН -СН ₂ СН ₃ -С(0) Н -Н -СН ₃ -СН ₃ -СН ₃ -Н -Н	269	НО-	-Сн2Сн3	-С(О)Н	. н-	-CH3	-сн,	н-	-СН,СН,	H-	-CH3
	270	но-	-сн,сн,	-с(о)н	н-	-сн3	-сн,	-CH ₃	H-	뿌	-CH ₃

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019	. E	[j F	Ę	Ą	-GH,	-GH,	-ĠĦ,	-ĠH,	Ĥ	Ę	, Ę	, E	Ġ.	Á	Ď	Ä	Ĥ
â	н-	Ŧ	H-	H-	н-	н-	-CH3	-CH2CH3	-CH3	-Сн,	-СН2СН,	-CH ₃	-CH ₃	H-	н-	Ę,	-сн,сн,	- £
•	н-	Ġ.	Ę	-СН,СН,	H-	-CH3	Н-	-н	н-	н-	н-	н-	H-	н-	н-	н-	H-	н-
ď	-Сн,	-GH,	-CH,	-CH3	-CH2CH3	-СН2СН3	н-	н-	Н-	Н-	H-	н-	н-	H-	Н-	н-	H-	F
, a	-сн,сн,	-СН,	-CH2CH3	-CH3	-CH ₃	-СН3	-CH3	-CH3	-CH2CH3	-сн,	-CH3	-сн,сн,	-сн,сн,	-СН,	-Сн2СН3	-CH,	-CH3	-сн,сн,
Ŗ	-CH,	-CH3	-СН,	-сн,	-CH3	-CH3	н-	н-	н-	-СН,	-СН3	-CH3	-СН3	-CH3	-СН,	н-	н-	H-
,	Н-	н-	н-	н-	H,	н-	-Н	н-	Н-	н-	#-	Ξ-	н-	н-	н-	н-	Н-	н-
ŭ	-С(0)Н	-С(О)Н	-с(о)н	-C(0)H	-с(о)н	-с(о)н	-OCH,	-0CH3	-OCH	-осн	-осн,	-0CH ₃	-OCH,	-0CH3	-OCH3	-осн,	-осн	-осн,
R,	-сн,сн,	-сн,сн,	-СН2СН3	-сн2сн3	-сн2сн3	-CH2CH3	-с(о)н	-с(о)н	-C(O)H	н (о) р-	-с(о)н	-с (о) н	-с(о)н	-с (о) н	-с(о)н	-с (о) н	н (о) р-	-с(о)н
14	но-	но-	но-	но-	но-	но-	-Сн,	-CH3	-CH3	-CH3	-CH3	-сн,	-сн,	-CH3	-сн3	-CH2CH3	-сн,сн,	-сн,сн,
Compound	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288

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₩ ₁₀	-Ġ	-CH ₃	-CH,	-CH3	-CH,	-CH,	-CH3	-CH,	-CH,	-CH ₃	-CH3	-CH3	-CH3	-CH,	-CH,	-CH,	-CH3	-ĠĦ,
R.	-CH3	-сн2сн,	-CH,	-CH3	-н	#-	-CH3	-CH2CH3	-сн3	-CH3	-сн,сн,	-СН,	-CH3	н-	н-	-CH3	-СН2СН3	-CH3
ž	н-	н-	H-	н-	Н-	н-	H-	н-	н-	н-	н-	н-	н-	Н-	н-	н-	н-	н-
R,	H-	H.	н-	н-	Н-	н-	н-	н-	Ħ	н-	H-	н-	Н-	н-	н-	н-	н-	н-
ž	-сн,	-CH3	-сн,сн,	-CH2CH3	-CH3	-сн2сн3	·HD-	-сн,	-CH2CH3	-CH3	-сн,	-CH2CH3	-CH ₂ CH ₃	-СН3	-сн2сн1	-CH3	-сн3	-CH2CH3
*	-CH ₃	-СН3	-Сн3	-сн,	-CH3	-CH3	н-	н-	н-	-сн,	-CH3	-сн,	-сн3	-СН3	-CH3	н-	н-	н-
Α.	н-	н-	н-	н-	н-	н-	-Н	-Н	н-	н-	н-	н-	н-	н-	-Н	-н	н-	н-
R³	-OCH ₃	-OCH3	-осн	-och	-OCH3	-0CH3	но-	но-	но-	-ОН	-ОН	HO-	-ОН	но-	но-	но-	но-	но-
R³	н (о) р-	-с(о)н	-с(о)н	-с(о)н	-с(о)н	-с(о)н	-с(о)н	-C(0)H	-С(О)Н	-с(о)н	-С(О)Н	н́ (О) Э-	-с(о)н	-С (О) Н	-С(О)Н	-с(о)н	-С(О)Н	-С(О)Н
R 1	-сн2сн3	-сн,сн,	-сн,сн,	-сн,сн,	-сн,сн,	-сн,сн,	-сн,	-CH3	-СН3	-Сн,	-СН,	-сн,	-сн,	-сн,	-сн,	-сн2сн,	-СН2СН3	-сн2сн3
Compound	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306

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F.10		<u> </u>	- -	-CH3	-GH,	Ę	Ğ	į	Ę	Î Đ	ا ا	j [Cm ₃	£	֓֞֞֓֓֓֓֓֟֓֟֓֟֟֓֟֓֓֓֟֓֓֓֟֟֓֓֓֟֓֓֓֟֓֓֓֟֓֓	5	Ę,	-CH	£ £	
â	י לים		-Cn2CH3	-CH ₃	-CH3	Ħ	#-	Ę	-CH,CH,	· CH,	LOHOH-	- Z		-CH ₃	Cm2Cm3	-CH3	-CH2CH3	-СН,	-CH3	
2	H-	; 5	:	Н-	н-	н-	H-	H-	н-	-СН,	-CH,	-CH.CH.		u 1	: 5		Cn ₃	-CH2CH3	Н-	٢
, w	H-	, n		Ħ,	-H	H-	Н-	н-	н-	н-	H-	н-	5		-CH.	Ę .		Ę.	-CH2CH3	-CH,CH,
24	-CH,	Ę		-CH2CH3	-CH2CH3	-СН,	-CH2CH3	-CH3	-сн,	-CH,	-CH3	-CH,	-CH.	-CH,	-CH,	CH.		-CH3	-СН3	-CH,
ă	-сн,	-CH,		, CH3	-сн3	-CH3	-CH3	н-	н-	H-	н-	н-	H-	н-	H-	H-	1	#	н-	н-
R.	Н-	H-	in .	F	н-	Н-	н-	н-	н-	н-	н-	н-	H-	H-	H-	H-	H	:	н-	н-
ra	но-	но-	HO-	5	-OH	но-	но-	-сн,	-CH3	-сн,	-CH3	-G,	-CH,	-CH3	-CH3	-CH3	Ę		-CH,	-CH ₃
ž	-C(0)H	-с (о) н	-C(0)H		н(о) э-	-с(о)н	-с(о)н	-С(О)Н	н (о) э-	н (о) э-	-C(0)H	-С(О)Н	-C(0)H	-с(о)н	-с(о)н	-C(0)H	-C (O) H		-С(О)Н	-C(0)H
R1	-CH2CH3	-сн,сн,	-СН,СН,		-CH2CH3	-сн2сн,	-CH2CH3	-0CH ₃	-0CH3	-0CH3	-осн,	-0CH3	-осн,	-OCH3	-OCH3	-осн,	-осн,		-0CH ₃	-осн
Compound	307	308	309		310	311	312	313	314	315	316	317	318	319	320	321	322		323	324

R10	-СН3	-CH3	-CH3	-CH,	-CH3	-CH3	-CH3	-СН,	-CH3	-CH3	-CH,	-CH3	-С.	-СН,	-CH,	-CH,	-CH3	-СН,
R	-сн,	-CH,	-CH3	-CH3	-сн,	-сн2сн3	-сн,	-CH3	-сн,сн,	-СН3	-сн2сн3	-сн,	-CH ₃	-Сн,	-Сн3	-CH ₃	-СН3	-CH,
R.	н-	-сн,	н-	-CH3	-СН,	-CH3	-CH2CH3	н-	н-	-сн,	-СН3	-сн2сн3	н-	-CH3	H-	-CH3	н-	-СН,
1 2	H-	щ	-СН3	-CH3	н-	н-	н-	-сн,	- CH,	-СН3	-сн3	-CH3	- CH2CH3	-CH2CH3	Н-	н-	-CH3	- CH,
ž	-СН2СН3	-CH2CH3	-CH2CH3	-сн2сн3	-CH3	-сн3	-сн,	-сн,	-СН3	-CH3	-сн,	-сн,	-сн,	-сн	-сн,сн,	-сн2сн3	-сн,сн,	-CH2CH3
R³	н-	н-	н-	, н-	- СН ₃	-CH3	-CH3	- CH3	-CH3	-CH3	-CH3	-сн,	-сн,	-сн,	-CH3	-сн,	-CH3	-сн,
R*	-H	н-	н-	-Н	н-	н-	н-	н-	н-	н-	н-	н-	н-	н-	н-	-н	- H	н-
R³	-CH3	-CH3	-CH3	-CH3	-сн,	-сн,	-CH3	-CH,	-CH3	-сн,	-СН3	-CH3	-CH3	-СН,	-CH3	-CH3	-CH3	-СН,
R²	н (о) р-	-с(о)н	-с(о)н	-С(О)Н	-С(О)Н	-с (о) н	-С(О)Н	н (о) а-	-С(О)Н	-с(о)н	-с(о)н	-с(о)н	-C(O)H	-с(о)н	-с(о)н	-C(O)H	-C(0)H	н (о) э-
Ŗı	-осн3	-OCH3	-осн,	-осн,	-осн,	-осн,	-осн,	-och,	-OCH3	-OCH3	-осн	-OCH3	-осн	-OCH3	-осн,	-OCH3	-осн,	-OCH,
Compound	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342

0 C(0)H -CH3 -H -CH4, CH4, CH3 -H -CH4, CH4, CH3, CH3, CH3, CH3, CH3, CH3, CH3, CH3		<u>.</u> ~	8	R³	R4	₽\$, K	R	R®	â	R10
CC(O)H -CH ₃ <	l	-осн,	-с(о)н	-CH3	н-	-CH3	-сн2сн3	н-	Н-	-CH,	. д.
-C(0)H -CH, -H -CH, -CH, <th< td=""><td></td><td>-осн,</td><td>-с(о)н</td><td>-сн,</td><td>Н-</td><td>-CH3</td><td>-сн,сн,</td><td>н-</td><td>-сн,</td><td>-CH3</td><td>-CH₃</td></th<>		-осн,	-с(о)н	-сн,	Н-	-CH3	-сн,сн,	н-	-сн,	-CH3	-CH ₃
-C(0)H -CH, -H -CH, -CH, <th< td=""><td></td><td>-och,</td><td>-с(о)н</td><td>-CH3</td><td>н-</td><td>-сн,</td><td>-сн,сн</td><td>-СН3</td><td>н-</td><td>-CH3</td><td>-CH,</td></th<>		-och,	-с(о)н	-CH3	н-	-сн,	-сн,сн	-СН3	н-	-CH3	-CH,
1 -C(0)H -CH3		-ocH3	-с(о)н	- CH3	н-	-CH3	-сн,сн,	-CH3	-CH3	-сн,	Ĥ,
-C(O)H -CH3 -CH4 -CH3 -CH2CH3 -H -CH3 -H -CH3 -H -H -CH3 -H		-осн	-с(о)н	- CH3	Н-	-Сн3	-СН3	н-	н-	Н-	-CH,
-C(O)H -CH3 -H -CH3 -CH3 -H -CH3 -H -CH3 -H -H -CH3 -H -H -H -CH3 -H -H -H -CH3 -H -H -CH3 -H -CH3 -CH		-осн	-с(о)н	-CH3	н-	-Сн3	-сн,сн,	н-	н-	н-	-ĠĦ,
-C(O)H -CH ₃ -CH ₃ -CH ₂ CH -H -CH ₃ CH -H -C(O)H -CH ₃ -H -CH ₃ -H -H -C(O)H -CH ₃ -H -CH ₃ -CH ₃		-осн,	-с(о)н	-сн,	н-	-CH3	-СН3	н-	-CH,	н-	-GH,
-C(O)H -CH, -H -CH, -CH, -CH, -H -CH, -CH, -C		-осн,	-С(0)Н	-СН	н-	-CH3	-сн,сн,	н-	-CH,	н-	-CH,
-C(O)H -CH ₃ <		-осн,	-с (о) н	-CH3	н-	-CH3	-CH3	н-	-СН,СН,	н-	-CH3
-C(0)H -CH ₃ <		-OCH3	-с(о)н	-CH3	н-	-СН,	-CH3	-CH ₃	F	н-	-СН,
-C(O)H -CH ₃ -H -CH ₃ -CH ₃ -CH ₃ -C(O)H -CH ₃ -H -CH ₃ -CH ₂ CH ₃ -CH ₃ -C(O)H -CH ₃ -H -CH ₃ -CH ₃ -CH ₃ -C(O)H -CH ₃ -H -CH ₃ -CH ₃ -CH ₃ -C(O)H -CH ₂ CH ₃ -H -CH ₃ -CH ₃ -CH ₃ CH ₃ -C(O)H -CH ₂ CH ₃ -H -CH ₃ -CH ₃ -H -CH ₃ -CH ₃		-осн3	н (о) э-	-CH3	н-	-CH3	-СН,СН,	-сн,	н-	н-	-CH ₃
-C(O)H -CH ₃ -H -CH ₃ -CH ₂ CH ₃ -CH ₃ -C(O)H -CH ₃ -H -CH ₃ -CH ₃ -CH ₃ -C(O)H -CH ₃ -H -CH ₃ -CH ₃ -CH ₃ -C(O)H -CH ₃ -H -CH ₃ -CH ₃ -C(O)H -CH ₂ CH ₃ -H -CH ₃ -CH ₃ -C(O)H -CH ₂ CH ₃ -H -CH ₃ -H -CH ₃		-осн,	-с(о)н	-CH3	н-	-сн3	-CH3	-CH3	-CH ₃	н-	-CH,
-C(O) H -CH, -H -CH, -CH, -CH, -CH, -CH, -CH,		-осн,	-с(о)н	-CH3	н-	-CH3	-CH2CH3	-CH3	-СН3	H,	-CH,
-C(O)H -CH ₃ -H -CH ₃ -CH ₃ -CH ₂ CH ₃ -C(O)H -CH ₂ CH ₃ -H -CH ₃ -CH ₃ -CH ₂ CH ₃ -C(O)H -CH ₂ CH ₃ -H -CH ₃ -CH ₃ -H		-осн,	-с(о)н	-CH3	н-	-сн,	-CH ₃	-CH3	-сн,сн,	н-	-CH3
-C(O)H -CH ₂ -H -CH ₃ -CH ₃ -CH ₂ CH ₃ -CCH ₃ -CCH ₂ CH ₃ -C(O)H -CH ₂ CH ₃ -H -CH ₃ -CH ₂ CH ₃ -H		-осн	-С(О)Н	-сн,	н-	-СН3	-CH,	-СН2СН,	н-	H-	-GH,
-C(0) H -CH,CH, -H -H -CH, -H	- 4	-OCH3	-с(о)н	-СН3	н-	-CH3	-CH3	-CH2CH3	-CH ₃	н-	-CH,
-С(0) Н -СН,СН, -Н -НСН.	- 1	-осн,	-С(О)Н	-CH2CH1	н-	н-	-СН,	н-	н-	-CH3	-CH,
- U		-OCH3	-С(0)Н	-сн,сн,	н-	н-	-CH3	#-	н-	-СН,СН,	-СН,

	R10	7	.	Ę.	-CH,	-CH,	-сн,	-CH.	, i	. J	· .	, .	٠,	٦	ا ي	٦	. 0	T	T		
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	å	-CH.		-cn ₂ cn ₃	-CH3	-CH,	-CH2CH3	-CH,	-CH,CH.	-CH.	E. CH.	[]	Cm ₃	-Cn ₃	-CH3	-CH3	-CH3	-CH,CH,	LCH.CH	100	(11)
	ž.	HD-	, 12	£11.7	-cm ₂ cm ₃	H-	н-	-CH3	-CH,	-CH,CH,	. н-	H	<u> </u>		ED-	H-	-сн [,]	H	Ę	-CH.CH.	
	, K	н-	H-	: :		, CH3,	-CH3	-CH3	-CH3	-CH3	-сн2сн3	-CH,CH,	, H	: :	4	E.	-CH,	H-	н-	H,	Ť
	å	-CH3	-CH,	, 12,		(III)	-CH3	-CH3	-CH ₃	-ĠĦ,	- CH,	-CH3	-CH,CH,			-ch2ch3	-CH2CH3	-сн,	-CH3	-GH,	
	R³	Н-	н-	Ħ	Ħ		н-	н-	н-	н-	H-	н-	H-	ä			H-	-сн,	-CH ₃	-CH3	
	* X	н-	Н-	H-	н-		н-	#-	н-	н-	н-	H-	- H	H-	ä		F	н-	Н-	н-	
	R ₃	-CH2CH3	-СП2СН3	-сн,сн,	-сн,сн,		-сн,сн,	-CH2CH3	-CH2CH3	-СН2СН3	-СН,СН,	-CH2CH3	-CH2CH3	-СН,СН,	-CH.CH.		-CH2CH3	-CH2CH1	-CH2CH3	-сн,сн,	i
	R.	-С(О)Н	н (о) э-	-C(0)H	н (о) р-	: (0) 0	-C(0)H	-С(0)Н	-С(О)Н	-с(о)н	-с(о)н	-С(0)Н	-С(О)Н	-С(О)Н	-С(0) Н	: (0)	-(O) #	-С(0) Н	-C(0)H	н(о) э-	n(0) 5-
1	×	-осн,	-0CH3	-осн,	-OCH,	150	-OCH3	-осн,	-OCH,	-OCH3	-осн,	-осн	-осн	-осн,	-0CH,	ח מים	funda 	-осн,	-OCH3	-och,	HJU-
╟─	compound	361	362	363	364	365	Car	366	367	368	369	370	371	372	373	374		375	376	377	378

Compound	R¹	R.	r _K	r L	R3	ñ.	R7	°¥.	ĸ.	Rio
379	-och	н (о) а-	-CH2CH3	н-	-CH,	- CH3	-CH3	Н-	-сн,сн,	-GH,
380	-och	-с(о)н	-CH ₂ CH ₃	н-	-CH,	-сн,	-СН3	-CH ₃	-сн,сн,	-сн,
381	-осн,	-с(о)н	-CH2CH3	н-	-CH	-сн	-CH ₃	-CH ₂ CH ₃	-CH3	-ĠĦ,
382	-0CH3	-с(о)н	-CH2CH3	н-	-CH3	-сн	-CH2CH,	н-	-CH3	-CH ₃
383	-OCH3	-с (о) н	-сн2сн3	н-	-CH3	·HD-	-CH2CH3	-CH3	-CH,	-ĠĦ,
384	-осн,	-С(О)Н	-CH2CH3	н-	-CH3	-сн2сн3	н-	н-	-CH3	-CH3
385	-ocH ₁	-С(О)Н	-сн,сн,	н-	-CH3	-сн2сн3	н-	-CH,	-CH3	-CH,
386	-осн	-с (о) н	-CH2CH3	н-	-CH3	-сн,сн,	-CH3	н-	-CH3	-CH3
387	-OCH3	-с(о)н	-сн2сн3	н-	-сн,	-сн,сн,	-CH3	-CH3	-СН,	-CH ₃
388	-осн	-с(о)н	-сн2сн3	н-	-CH3	-CH2CH3	н-	н-	-CH,	-CH3
389	-осн,	-С (О) Н	-сн,сн,	н-	-CH3	-сн,сн,	н-	-СН,	-СН,	-CH ₃
390	-осн	-С(О)Н	-сн,сн,	н-	-CH3	-СН2СН3	-CH3	н-	-CH,	-CH3
391	-осн,	-С(О)Н	-сн2сн,	н-	-CH3	-CH2CH3	-CH3	-CH3	-CH ₃	-CH3
392	-осн,	-с(о)н	-сн,сн	н-	-CH3	-CH ₃	Н-	н-	H-	-CH3
393	-OCH ₃	-C(O)H	-СН2СН3	н-	-CH3	-сн2сн3	н-	н-	H-	-CH,
394	-OCH ₃	-С(0)Н	-сн,сн,	н-	-сн,	-CH3	н-	-CH,	Н-	-CH3
395	-осн,	-С (О) Н	-сн,сн,	н-	-СН3	-сн2сн,	н-	-CH,	н-	-ĠĦ,
396	-осн,	-с(о)н	-сн2сн,	н-	-сн3	-CH3	н-	-сн2сн,	н-	-GH,
								1		

		f.	-CH ₃	-сн,	-СН,	-CH,	-CH,	-GH,	-CH,	-CH,	-CH.	, EH.	CH.	ĠĦ,	-CH.	, E		Ę	•
	* *	; ;	F	н-	Н-	н-	H-	H	-CH ₃	-CH ₂ CH ₃	Ę	-CH,CH,	· CH,	-CH.	+_	+	+	-	
	a a		- - -	-Сн,	-CH,	-сн,сн,	H-	-CH3	H-	H-	-CH,	+	+-	н-)- H-	-Сн,	+	-СН2СН3	_
	T.	£ 5		-СН3	-CH ₃	-CH, -(-сн,сн,	-CH ₂ CH ₃	#-	н-	-н	H-)- H-	-CH3	-CH,	-CH,	-CH,	-CH ₃	
94	-CH.	-CH.CH.		-сн,	-сн,сн,	-Сн3	-CH,	-CH,	-CH,	-CH3	-CH3	-CH,	-CH3	-CH,	-CH ₃	-GH,	-CH,	-CH,	
Rs	Ę	Ę		-СН,	-CH3	-Сн,	-СН3	-СН3	Н-	н-	н-	H-	H-	н-	н-	н-	н-	н-	
, x	#-	H-		н-	н-	н-	н-	н-	н-	H-	. н-	н-	н-	н-	н-	н-	н-	н-	
r _z	-сн,сн,	-CH2CH3		-сн,сн,	-СН2СН3	-CH2CH3	-сн,сн,	-сн,сн,	-осн,	-осн,	-осн3	-OCH3	-осн,	-осн,	-och	-осн,	-0CH3	-ОСН	
R2	н(о) э-	н(о) э-	: (0)	н (о) э-	-С(0)н	-с(о)н	-с(о)н	-с(о)н	-с(о)н	-С(0)Н	-C(0)H	-С(О)Н	-с(о)н	-с(о)н	-С(О)Н	-с(о)н	-С(О)Н	-с(о)н	
A.	-осн3	-осн	100	-0CH ₃	-осн,	-осн,	-осн,	-осн,	-OCH1	-0CH,	-OCH3	-осн,	-осн	-осн,	-OCH,	-OCH3	-осн	-och,	
Compound	397	398	300	333	400	401	402	403	404	405	406	407	408	409	410	411	412	413	

		بي [T	T	T	Т		Ī	Т	T	T
R.10	-CH,	-CH,	-CH3	-CH,	-CH,	-CH,	-CH ₃	-CH3	-CH,	-CH,	Ę.	-ĠĦ,	-CH,	-GH ₂	Ę,	₽	Ę.	-CH,
R.	Ę	-СН,	-CH3	-сн,	-CH,	-CH2CH3	-СН,	-CH2CH3	-CH3	-CH,CH,	-CH3	-СН,СН,	-CH,	-CH3	-CH,	-сн,	-CH3	-CH3
å	-CH3	Н-	-сн,	H-	-CH3	н-	-СН3	-СН,	-СН,СН,	н-	-CH3	-СН3	-CH2CH3	н-	-CH3	н-	-CH3	н-
Ą	-сн,сн,	Н-	н-	-сн,	-СН,	н-	н-	н-	н-	-CH,	-CH ₃	-СН,	-CH3	-СН2СН3	-CH2CH3	H-	н-	-CH3
Ř	, £	-сн,сн,	-CH2CH3	-CH2CH3	-CH2CH3	-сн,	-CH3	-сн	-CH ₃	-CH3	-CH3	-CH3	-CH3	-CH3	-Сн,	-CH2CH3	-СН2СН3	-СН2СН3
Ŗ	Ħ	н-	Н-	н-	н-	-CH3	-CH ₃	-CH3	-сн,	-CH,	-CH3	-сн3	-CH3	-CH3	-CH,	-CH3	-СН,	-CH3
, a	Н-	н-	н-	н-	-H	-н	н-	н-	н-	н-	н-	н-	н-	н-	н-	н-	н-	н-
R³	-OCH ₃	-0CH3	-OCH3	-OCH ₃	-OCH3	-OCH ₁	-осн,	-осн,	-OCH3	-OCH,	-OCH	-OCH3	-OCH3	-OCH3	-OCH3	-осн,	-och,	-осн3
R²	н (о) э-	-с (о) н	-с (о) н	-С(0)Н	-с(о)н	-с(о)н	-с(о)н	-C(O)H	-с(о)н	-С(О)Н	-C(0)H	-с(о)н	-с(о)н	-с(о)н	-с(о)н	-С(о)н	-с(о)н	-с(о)н
R	-осн,	-OCH3	-0CH3	-осн,	-осн,	-осн,	-осн,	-OCH3	-OCH3	-OCH3	-OCH3	-OCH,	-OCH3	-осн,	-осн,	-осн,	-och	-осн,
Compound	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432

Compound	R 1	R ²	R³	ŭ	æ.	č	'n	×		R10
433	-осн	-C(O)H	-осн	H-	-CH ₃	-сн,сн,	-CH ₃	-GF,	-сн,	-Сн,
434	-осн	н(о) р-	-0CH3	н-	-СН3	-СН2СН3	H-	н-	-CH,	-CH,
435	-осн	-с (о) н	-осн,	Н-	-СН3	-CH2CH3	н-	-CH3	-СН,	, E
436	-осн	-C(O)H	-осн3	Н-	-CH3	-CH2CH3	-СН,	н-	-CH,	-GH,
437	-осн	-с(о)н	-осн	Н-	-CH3	-CH2CH3	-сн,	-CH3	-CH,	-СН,
438	-OCH3	-с(о)н	-och	н-	-CH3	-CH3	н-	н.	н-	-CH3
439	-OCH3	-с(о)н	-0CH3	н-	-CH3	-СН2СН3	н-	н-	H-	-СН,
440	-OCH ₃	-с(о)н	-осн	н-	-CH3	-СН,	н-	-CH ₃	H-	-CH,
441	-OCH3	-С(О)Н	-0CH3	н-	-CH3	-CH2CH3	#-	-CH3	н-	-CH3
442	-OCH,	-С(О)Н	-OCH	н-	-CH3	-CH ₃	н-	-сн,сн,	H-	-CH,
443	-OCH3	-с(о)н	-осн	н-	-СН3	-CH3	-CH3	н-	н-	-СН,
444	-OCH ₃	-с(о)н	-осн	н-	-CH ₃	-СН2СН3	-СН,	н-	н-	-CH3
445	-OCH3	-с(о)н	-OCH	н-	-CH3	-CH3	-СН,	-CH3	н-	-СН,
446	-осн,	-с (о) н	- OCH ₃	н-	-СН3	-сн,сн,	-CH3	-CH3	H	-CH,
447	-OCH,	-C(0)H	-осн,	н-	-СН,	-GH,	-CH,	-сн,сн,	H-	-CH ₃
448	-осн,	-с(о)н	-осн,	н-	-CH3	-CH3	-CH2CH3	н-	#-	-CH3
449	-осн,	-с(о)н	-осн	н-	-СН3	-CH3	-СН2СН3	-CH3	H-	-CH3
450	но-	-с (о) н	-CH3	н-	H-	-СН,	H-	#-	-GH,	-СН,
										,

Compound	R.	κ ²	ra _s	x *	ga	~	æ	2	å	R10
451	но-	н (о) э-	-CH ₃	н-	Н-	-сн,	н-	н-	-CH,CH,	-CH.
452	но-	-C(0)H	-CH3	н-	H-	-CH3	н-	-ĊĦ,	Ð	<u> </u>
453	но-	-с(о)н	-СН,	н-	H-	-CH3	H-	GH CH	HO.H.O.	1
454	но-	-с (о) н	-CH3	н-	н-	-CH ₃	н-	-СН,СН,	-CH.	(H)
455	но-	-с (о) н	-CH3	H-	H-	-СН,	-СН3	H-	Ę	Ę
456	но-	-с(о)н	-CH3	H-	н-	-СН3	-CH3	H-	-CH,CH,	GH,
457	но-	-С (о) н	-сн,	н-	н-	-СН,	-CH3	-CH3	-СН,	, CH,
458	но-	-C(0)H	-сн,	н-	н-	-СН,	-СН,	-CH3	-СН,СН,	-CH,
459	но-	-С(О)Н	-сн3	н-	н-	-СН,	-Сн,	-CH2CH3	-CH3	-CH,
460	но-	-с(о)н	-сн3	Н-	н-	-CH3	-сн,сн,	н-	-сн,	, E
461	но-	-с(о)н	-CH3	н-	н-	-CH3	-сн,сн,	-CH,	-ĈH,	j E
462	но-	-С(О)Н	-CH3	Ħ,	-н	-CH2CH1	Ħ	#	ָ װ	7 8
463	но-	-C(0)H	-CH,	н-	н-	-СН2СН,	H-	-CH,	E -	£ £
464	но-	-С(О)Н	-CH,	н-	H-	-СН,СН,	ĠĦ,	, #		
465	но-	-С(О)Н	-CH3	н-	H	-CH ₂ CH ₃	-CH,	: 5	F 2	
466	но-	н (о) э-	-СН,	H,	-CH3	-CH3	H-	F.	[m]	
467	но-	-с (о) н	-CH3	H,	-СН,	-CH3	-н	-CH,	CH.	(F)
468	но-	-С(О)Н	-CH3	н-	-CH,	-CH,	н-	. H	5	
						,	· .	;	- Cn2Cn3	£

Compound	R1	R2	R	, α	şa	Î				
900	11					¥	K	æ	R*	R10
469	#6-	-С(О)Н	-СН3	н-	-сн,	-CH3	н-	-CH2CH3	-CH3	-CH3
470	-ОН	-C(O)H	-CH ₃	н-	-сн	-CH3	-CH3	н-	-CH,	-CH.
471	но-	-C(0)H	-CH3	н-	-CH3	-СН,	-CH,	н-	-CH,CH,	LCH.
472	-ОН	-С(О)Н	-Сн,	н-	-СН,	-CH3	-сн,	- CH,	. 8	5
473	-ОН	н (о) р-	-CH3	н-	-CH,	-CH,	-CH3	-CH,	-CH.CH.	E. 1
474	но-	-С(О)Н	-СН,	н-	-CH3	-CH3	-GH,	-CH,CH.	- C	(m)
475	но-	н (о) э-	-CH ₃	H-	-CH,	-CH,	-СН,СН,	H-	H. H.	F 2
476	но-	н (о) э-	-CH3	н-	-CH3	-CH3	-СН2СН1	Ę,	i E	E .
477	но-	-с(о)н	-CH3	H-	-CH3	-СН,СН,	H-	H	- CH	(H)
478	но-	н(о) э-	-CH3	н-	-CH,	-СН2СН3	H-	-CH.	[] E	
479	но-	-С(О)Н	-CH3	H-	-CH3	-Сн,сн,	-GH.	î P		(H)
480	но-	-C(0)H	Ę,	Ħ	H.	1 2 2		:	(E)	-CH ₃
481	HO-	-C (O) H	, E	1		Cm2Cm3	- CH ₃	- GH,	-CH,	-СН,
				•	(F)	-CH2CH3	ij.	н-	-Ġ.	-CH3
482	НО-	-C(0)H	-CH3	-н	-СН,	-сн,сн,	H-	-CH3	-ĠĦ,	-CH,
483	но-	-C(O)H	-СН,	н-	-CH3	-CH2CH3	-CH ₃	H-	. E	
484	но-	-с(о)н	-CH,	H-	-СН,	-сн,сн,	GH.	15		(H)
485	но-	-с(о)н	-CH,	-H	-CH ₃	, ĜH,	f H-	- I	F	H
486	но-	-C(0)H	-CH,	H-	-CE	-CH.CH	;	: :	u,	-CH3
						_cn2cn3	н-	#-	н-	-CH3

Compound	R *	R3	£ K	A	R.	å	8 .	×	â	R10
487	но-	н (о) р-	-CH3	н-	-CH,	-сн,	н-	-CH3	н-	-сн,
488	но-	-с(о)н	-сн,	Н-	-CH3	-сн,сн,	н-	-CH ₃	н-	-GH,
489	но-	-С(0)н	-CH3	н-	-СН3	-CH3	н-	-CH2CH3	Н-	-СН,
490	но-	-C(0)H	-CH3	н-	-сн	-СН,	-CH3	н-	H-	-CH,
491	но-	-с(о)н	-CH3	н-	-CH3	-сн2сн3	-CH3	н-	н-	-Сн,
492	но-	-С(О)Н	-сн,	н-	-сн	-CH3	-СН,	-сн,	Н-	-СН,
493	но-	-с (о) н	-СН3	-H	-CH3	-CH2CH3	-CH3	-сн,	н-	-CH3
494	но-	-с (о) н	-CH3	н-	-CH3	-CH3	-CH3	-СН,СН,	Н-	-CH3
495	но-	-С(0)Н	-CH3	н-	-СН,	-CH3	-CH2CH3	н-	н-	-CH3
496	но-	-с(о)н	-CH3	н-	-CH,	-CH3	-CH2CH3	-сн,	н-	-СН,
497	но-	-С(О)Н	-сн,сн,	н-	н-	-CH3	н-	н-	-CH3	-CH,
498	но-	-C(O)H	-сн2сн3	н-	н-	-CH ₃	н-	-н	-СН2СН3	-CH3
499	но-	-с(о)н	-сн,сн,	н-	н-	-СН3	Н-	-CH3	-CH3	-CH,
200	но-	-с(о)н	-сн,сн,	Н-	н-	-СН,	Н-	-CH3	-СН2СН3	-CH ₃
501	но-	н (о) э-	-сн2сн,	-H	н-	-СН,	н-	-CH2CH3	-CH3	-CH3
502	но-	-с(о)н	-CH2CH3	н-	н-	-CH,	-CH ₃	H-	-CH3	-СН,
503	но-	-с(о)н	-сн,сн,	н-	н-	-CH ₃	-CH3	H-	-СН,СН,	-СН,
504	но-	-с(о)н	-CH2CH3	н-	н-	-CH,	-CH3	-CH3	-CH,	-СН,

	1	T	T	T	T	T	T	T	T	T-	T	T	 	-	T	T	T	T
Α. 10	-GH,	-Ġ	-CH3	-CH ₃	-GH,	-CH3	-ĊĦ,	-CH,	-CH ₃	-CH,	-CH3	-CH,	-CH3	-CH3	-CH,	-CH,	-GH,	-GH,
•2€	-Сн,	-CH3	-CH3	-сн,	-сн,	-сн,	-сн,	-СН,	-CH3	н-	н-	н-	н-	н-	н-	н-	н-	н-
*	-сн,	н-	-сн,	H-	-CH3	H-	-СН3	Н-	-СН,	н-	н-	-сн,	-СН,	-сн,сн,	н-	н-	-CH3	-Сн,
A	-CH2CH3	н-	Н-	-CH3	-сн,	н-	н-	-CH ₃	-CH3	н-	н-	Н-	#	н-	-CH3	-сн,	-CH3	-CH,
×	-CH3	-сн2сн3	-CH2CH3	-CH2CH3	-CH2CH3	-сн,сн,	-CH2CH3	-CH2CH3	-сн,сн,	-СН3	-СН2СН3	-CH3	-CH2CH3	-СН3	-CH3	-сн,сн,	-CH3	-СН,СН,
R³	-сн,	-CH3	-CH3	-CH3	-сн3	-CH3	-сн3	-CH3	-CH3	-CH3	-CH3	-CH3	-CH3	-СН3	-CH ₃	-CH3	-сн3	-CH,
R.	H-	н-	н-	н-	-H	н-	-н	н-	н-	н-	н-	н-	н-	н-	н-	н-	н-	н-
RJ	-CH2CH3	-CH2CH3	-CH2CH1	-сн,сн,	-сн,сн,	-сн,сн,	-сн,сн,	-сн,сн,	-СН,СН,	- CH2CH3	-CH2CH3	-CH2CH3	-сн2сн3	-сн2сн3	-сн,сн,	-CH2CH3	-CH2CH3	-CH2CH3
R²	н (о) э-	-с(о)н	-С(О)Н	-с (о) н	-с (о) н	-с(о)н	-с(о)н	-C(0)H	-с(о)н	-с(о)н	-С(О)Н	-с(о)н	н (о) р-	-С(О)Н	-C(0)H	-с(о)н	-с(о)н	-с (о) н
R¹	но-	но-	но-	но-	но-	но-	но-	но-	-ОН	-ОН	-ОН	-ОН	но-	-ОН	но-	но-	но-	-ОН
Compound	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540

Compound	R	R³	R,	ř.	R\$	Ré	, B	ž.	°×	R10
541	но-	н (о) э-	-CH2CH3	н-	-CH3	-CH3	-сн3	-сн2сн3	Н-	-œ,
542	но-	-с(о)н	-CH2CH3	н-	-CH3	-CH3	-СН2СН3	н-	н-	-CH,
543	-ОН	-с(о)н	-CH2CH3	н-	-CH3	-CH3	-CH2CH3	-CH3	н-	-CH3
544	-осн	-CH3	-C(O)H	- (CH ₂) ₂ -	₁₂) ₂ -	-сн3	н-	H	-CH ₃	-сн,
545	-осн,	-CH,	-C(O)H.	- (CH ₂) ₂ -	¹ 2, 2-	-СН3	н-	Н-	-сн2сн,	-СН3
546	-осн	-СН3	-с (о) н	- (CH ₂) ₂ -	(2) 2-	-CH2CH3	н-	н-	-CH3	-CH3
547	-осн	-сн,сн,	-с(о)н	- (CH ₂) ₂ -	12)2-	-CH3	н-	H-	-CH3	-сн,
548	-ocH ₃	-СН2СН3	-с(о)н	- (CH2) -	2) 2-	-CH3	н-	н-	-СН2СН3	-СН,
549	-0CH,	-CH2CH3	-с(о)н	- (CH2) -	2)2-	-сн2сн3	H-	#-	-СН,	-СН,
550	-осн,	-осн,	-с(о)н	- (CH ₂) ₂ -	2)2-	-сн,	н-	н-	-СН,	-СН3
551	-осн,	-OCH3	-с(о)н	- (CH ₂)	2)2-	-CH3	Ħ	н-	-сн,сн,	-СН3
552	но-	-CH,	-с(о)н	- (CH ₂) ₂ -	2) 2-	-CH3	н-	Н-	-CH3	-CH3
553	но-	-СН,	-с (о) н	- (CH ₂) ₂ -	2) 2 -	-сн,	н-	н-	- CH2CH3	-CH3
554	но-	-CH,	-С(О)Н	- (CH ₂) ₂ -	-2(1	-сн2сн3	н-	н-	-CH3	-CH,
555	но-	-сн,сн,	-С(0)Н	- (CH ₂) ₂ -	, 3-	-CH3	н-	н-	-CH ₃	-СН,
556	но-	-сн,сн,	-с(о)н	- (CH ₂) ₂ -	-2(-сн,	н-	н-	-СН2СН3	-СН,
557	но-	-CH2CH3	-с(о)н	- (CH ₂) ₂ -	-2(-сн,сн,	н-	Н-	-CH3	-сн,
558	-OCH,	н (о) э-	-CH3	- (CH ₂) ₂ -	-2(:	-CH3	н-	н-	-CH,	-CH3

Compound	¥.	R3	ra a	,a	\$6	9				
					4	¥	X	R.	g.	R10
559	-осн,	-с(о)н	-CH ₃	- (د	- (CH ₂) ₂ -	-CH3	н-	н-	-сн,сн,	-CH,
560	-осн3	-с(о)н	-CH3	သ) -	- (CH ₂) ₂ -	-CH2CH3	н-	H-	Ą	-CH.
561	-осн	н (о) э-	-сн,сн,	ר (כו	- (CH ₂) ₂ -	-CH,	H-	н-	-CH.	5
562	-OCH ₃	-с (о) н	-CH2CH,	ר (מ	- (CH ₂) ₂ -	-CH3	Ħ,	H-	-CH.CH.	f) H)-
563	-OĊH³	-с(о)н	-CH2CH3	[] -	- (CH ₂) ₂ -	-сн,сн,	F	H-	-CH.	HU-
564	-0CH3	-с(о)н	-OCH3	ר (כו	- (CH ₂) ₂ -	-CH3	Ħ	н-	CH.	ָּבָּי נְיִּבְּי נְיִּבְּיִי
565	-осн,	н(о) э-	-осн	- (C	- (CH ₂) ₂ -	-СН,	Н-	н-	-CH.CH.	
566	-осн	н (о) э-	-0CH3	- (Ct	- (CH ₂) ₂ -	-СН2СН3	н-	H-	-CH.	H.J.
567	-ОН	н (о) э-	-CH,	- (CF	- (CH ₂) ₂ -	-CH ₃	н-	н-	GH.	E. H.
568	но-	-C(0)H	-СН,	- (CH ₂) ₂ -	12)2-	-СН,	H	H-	- כא כא	E 1
569	но-	-с(о)н	-CH,	- (CH ₂) ₂ -	2)2-	-CH2CH3	H	H	- CH	F 2
570	но-	-с(о)н	-СН2СН	- (CH,),-	-: (;	H.) -	17	:		(m)
571	но-	-C(0)H	-CH2CH3	- (CH,),-	.,,-	- E	: #	=	CH ₃	- CH3
572	но-	-с(о)н	-CH2CH3	- (CH ₂),-	-, (,	-CH.CH.	: #		-CH ₂ CH ₃	- CH3
573	-0CH3	-Сн,	-C(0)H	H-	#-	- (CH.) -		‡ Þ	£ .	ED-
574	-0CH3	-CH,	-C(0)H	H-	# "	E (Z)		# :	£,	- CH.
575	HJO'	12	: (0)	:		1cm2	-[,	Ŧ	-CH2CH3	-СН,
		- (m ₃	H(0)7-	Ŧ	-ĠĦ,	- (CH ₂) ₃ -) 3 -	н-	#-	-сн,
576	-OCH	-CH3	-C(0)H	н-	-сн,	- (CH ₂) ₃ -] (H-	-СН,	Ę.
									-	;

Compound	W	x 3	R³	8	RS	R*	R	R,	R10
	-OCH3	-сн3	-с(о)н	н-	-сн,	- (CH ₂) ₃ -	н-	-Сн.сн.	H.J
	-OCH3	-СН3	-C(0)H	H-	-CH2CH3	- (CH ₂) ₃ -	H.	H-	<u> </u>
	-OCH3	-сн,	-C(0)H	н-	-CH2CH3	- (CH ₂) ₃ -	Н-	-CH,	
	-ОН	-сн	-C(0)H	н-	н-	- (CH ₂) ₃ -	Н-	-CH,	E
	-ОН	-сн,	-с(о)н	н-	н-	- (CH ₂) ₃ -	н-	-CH,CH,	-CH
	-ОН	-CH3	-С(О)Н	н-	-CH3	- (CH ₂) ₃ -	н-	H	E E
	-ОН	-CH3	-C(0)H	н-	-CH3	- (CH ₂) ₃ -	н-	-CH,	
•	но-	-сн	-C(0)H	Н-	-CH ₃	- (CH ₂) ₃ -	н-	-CH,CH,	j E
j	-ОН	-сн,	-С(О)Н	н-	-СН2СН3	- (CH ₂) ₃ -	#-	, z	H. H.
1	но-	-СН,	-с(о)н	н-	-сн,сн,	- (CH ₂) ₃ -	H-	E.	֓֞֞֞֜֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓
1 1	-осн,	-СН2СН3	-C(0)H	H-	H,	- (CH ₂) ₃ -	#-		F .
	-осн,	-CH2CH3	-с(о)н	H-	н-	- (CH ₂) ₃ -	H-	-CH,CH,	
	-осн,	-сн,сн,	н (о) р-	н-	-CH3	- (CH ₂) ₃ -	н-	H-	
	-осн,	-СН2СН3	н(о) э-	Н-	-CH3	- (CH ₂) ,-	H,	Ę	H.J.
	-OCH,	-CH,CH,	-с (о) н	Ħ	-GH3	- (CH ₂) ₁ -	#-	HU HU-	
	-OCH ₃	-CH2CH3	-С(О)Н	н-	-CH2CH3	- (CH,),-	ä,		
	но-	-сн,сн,	-C(O)H	н-	н-	- (CH ₂),-	: #	: =	Can
	но-	-СН,СН,	-C(O)H	.Н-	н-	- (CH,),-	: #	ביין	-Ch3
					-			C412C413	(H)

Compound	R	*	£K	,X	RS	Ké R7	ķ	ê	R10
595	но-	-сн2сн3	н (о) э-	н-	-сн	- (CH ₂) ₃ -	н-	н-	-CH ₃
596	но-	-сн,сн,	-с(о)н	н-	-CH3	- (CH ₂) ₃ -	Н-	-СН3	-GH,
597	но-	-сн2сн3	-С(О)Н	н-	-CH3	- (CH ₂) ₃ -	н-	-сн,сн,	-Сн,
598	но-	-сн,сн,	-с(о)н	н-	-CH2CH3	- (CH ₂) ₃ -	н-	н-	-CH,
599	но-	-сн2сн3	-с(о)н	н-	-CH2CH3	- (CH ₂) ₃ -	н-	-СН,	-CH3
909	-och	-och,	-с(о)н	н-	н-	- (CH ₂) ₃ -	н-	-CH3	-сн,
601	-осн,	-осн,	-с(о)н	н-	н-	- (CH ₂) ₃ -	н-	-CH2CH3	-CH3
602	-OCH3	-OCH	-с(о)н	н-	-CH3	- (CH ₂) ₃ -	н-	-H	-СН,
603	-осн	-осн	н (о) э-	н-	-CH3	- (CH ₂) ₃ -	н-	-CH3	-сн,
604	-OCH,	-OCH3	-с(о)н	н-	-CH	- (CH ₂) ₃ -	н-	-сн,сн,	-CH3
605	-осн	-OCH3	-с(о)н	н-	-CH2CH3	- (CH ₂) ₃ -	н-	Н-	-CH3
909	-och	-осн	-с(о)н	н-	-СН2СН3	- (CH ₂) ₃ -	н-	-CH3	-CH3
607	-осн	-C(0)H	-сн,	н-	н~	- (CH ₂) ,-	н-	-CH,	-сн,
809	-осн,	-C(0)H	-сн,	н-	н-	- (CH ₂),-	H-	-СН2СН3	-CH,
609	-осн,	-с(о)н	-CH3	н-	-сн,	- (CH ₂) ₃ -	H-	н-	-CH,
610	-осн,	-C(0)H	-CH3	н-	-CH3	- (CH ₂) ₃ -	н-	-CH3	-CH,
611	-0CH ₃	-с(о)н	-СН,	н-	-CH3	- (CH ₂) ₃ -	H-	-CH2CH3	-CH3
612	-OCH3	н (о) э-	-сн,	н-	-сн,сн,	- (CH ₂) ₃ -	н-	н-	-Сн3

		-CH ₃	-CH,	н,	£.	.]	, T.	ŗ.	<u>.</u>	<u>.</u>	٦	ا بي	. m	Τ.	.T	T	Ţ				T
	*	۲	۲	-CH3	-CH3	٢		E	(E)	5	Ĥ,	Ą	-CH ₃	Ę	1	9	-G	-CH,	-GH,	Ą	` {
•	4	(H)-	-CH ₃	-CH2CH3	н-	ŧ	ב מולים	Cu2Cu3	: }	Ę, i	. CH.	-СН2СН,	н-	Ę.	HO HO	:	H,	-CH3	-CH3	-сн,сн,	
ů.	, la	; ;	H-	-Н	н-	Н-	#	: #-	р п	: ;	:	F-	-H	Н-	F	-	: :	F	н-	н-	n
Re R7	- (CH2)	(nJ) -	(412/3-	- (CH ₂) ₃ -	- (CH ₂) ₃ -	- (CH ₂) ₃ -	- (CH,),-	- (CH ₂),-	- (CH,),-	- (CH2) -	(no) -	(cm2/3-	- (CH ₂) ₃ -	- (CH ₂) ₃ -	- (CH ₂) ₃ -	- (CH.)	· (CH) -	(512/3-	- (CH ₂) ₃ -	- (CH ₂) ₃ -	- (CH,),-
æ	-CH2CH3	H-	:	F	-CH,	-CH3	-CH,	-CH2CH3	-CH2CH,	H-	H	į	-(H ₃	-Сн3	-СН,	-СН,СН,	-CH,CH,		Ŧ,	н-	-CH,
ŭ	н-	H-	17	:	H-	н-	н-	H-	Н-	н-	H			-н	Н-	H-	H	n	F	н-	H-
R³	-Сн,	-GH,	-CH.		-GH ₃	-CH3	-СН3	-СН,	-CH3	-сн,сн,	-CH,CH,	-CH.CH.		-сн,сн,	-СН,СН,	-CH2CH3	-Сн,сн,	CH.CH.		-сн,сн,	-сн,сн,
, K	н (о) э-	-С(О)Н	-C(0)H	: (0)	-C(0)H	-С(0)н	-С(О)Н	-С(О)Н	-с(о)н	-С(О)Н	-C(0)H	-C (O) H		-С(0)н	-с(о)н	-с (о) н	-C(O)H	-C(0)H	+	H(0)2-	-с(о)н
R1	-осн	но-	HO-	no-	5	НО-	-ОН	но-	но-	-осн	-OCH3	-OCH,		-0CH ₃	-осн,	-осн,	-осн,	но-	+	HO-	но-
Compound	613	614	615	616		617	618	619	620	621	622	623		974	625	626	627	628	000	670	630

Compound	R1	R 3	æ	, a	ĸ	Ré	å	í	910
631	но-	-С(О)Н	-CH2CH3	H-	-CH,	- (CH2) -	ħ	;	*
632	HO-	H(O) U-	מל מי	:		5 17	u-	, H	-GH,
		::/2\2	_cm2cm3	н-	~CH3	- (CH ₂) ₃ -	н-	-CH,CH,	-CH,
633	но-	-с(о)н	-СН2СН3	H-	-сн2сн,	- (CH ₂) ₃ -	H-	Ħ	, Inc
634	но-	-С(О)Н	-сн,сн,	H-	-СН,СН,	- (RJ) -	;	:	-cn,
						(5.57)	н-	-CH ₃	-CH,
635	-OCH3	-C(0)H	-осн,	H-	Н-	- (CH ₂) ₃ -	н-	GH.	5
636	#00-	(O) 5-				_			(11)
	£,,,,,	#(O) >-	-OCH,	н-	н-	- (CH ₂) ₃ -	н-	-сн,сн,	ij
637	-OCH3	-с (о) н	-0CH3	н-	-CH,	- (CH,),-	=		
630						5.7	:	-1.1	-CH3
020	-OCH3	-C(0)H	-OCH	н-	-CH3	- (CH ₂) ₃ -	н-	-Ġ	<u>ب</u>
639	-осн,	H(0) D-	-OCH.	1	į				
	,		[]	5	- CH3	- (CH ₂) ₃ -	н-	-CH2CH3	-CH3
640	-осн,	-C(0)H	-OCH	н-	-CH2CH3	- (CH ₂) ₃ -	F	##	12.0
641	HJO-	H (0) 5							Cata
	ocu;	# (O) 7	-OCH ₃	Ħ-	-CH2CH3	- (CH ₂) ₃ -	H	-GH	Ġ,
)	•

present disclosures.

The novel alkyl tetralin aldehyde compounds of the present invention, with their musk aroma properties, have high utility in the fragrance industry. These compounds can be employed alone, in combination with one another, and/or in combination with one or more ingredients to provide excellent musk fragrance compositions. The compounds of the invention are particularly useful in rounding off compositions, and blend particularly well with aldehydes of various fragrance types.

10 For example, the compounds of Formula [I] may be used as olfactory components in anionic, cationic, nonionic and zwitterionic detergents, soaps, fabric softener compositions, fabric softener articles for use in clothes dryers, space odorants and deodorants, perfumes, colognes, 15 toilet water, toiletries, bath preparations, deodorants, cosmetics, hand lotions, sunscreens, powders, as well as in other ways. The amount of the subject compounds to be used in modifying the olfactory or fragrance properties of a composition (that is, modifying, augmenting, enhancing, or 20 improving the aroma of such compositions), will vary depending upon the particular use intended, as will be readily apparent to those skilled in the art. Although they may be present in major or minor amounts, preferably, because of the strength of their odor, the compounds of the 25 invention are generally employed as a minor ingredient, that is, in an amount of about 0.1 percent by weight of the fragrance composition up to about 50 percent by weight of the fragrance composition, preferably about 0.1 percent by weight up to about 30 percent by weight of the fragrance 30 composition, and most preferably about 0.1 percent by weight up to about 5.0 percent by weight of the fragrance composition. Within these basic parameters, the olfactorily effective amount (that is, the amount of the compounds of Formula [I] effective to modify, augment, enhance or improve 35 the aroma properties of a composition) will be well within the ambit of one skilled in the art, once armed with the

The fragrance compositions of the invention may, if desired, contain a carrier or vehicle (as used herein, the term "carrier" shall be considered synonymous with the term "vehicle"). Such carriers include liquids such as a 5 non-toxic alcohol, a non-toxic glycol, or the like. example of a non-toxic alcohol is ethyl alcohol. An example of a non-toxic glycol is 1,2-propylene glycol. Alternatively, the carrier can be an absorbent solid such as a gum, e.g., gum arabic, xantham gum or guar gum, or 10 components for encapsulating a composition such as gelatin, by means of coacervation or such as a urea formaldehyde polymer whereby a polymeric shell is formed around a liquid perfume oil center. The amount of the vehicle or carrier will vary depending upon the particular vehicle or carrier 15 employed and use intended, as will be readily apparent to those skilled in the art. However, the vehicle or carrier can generally be employed in an amount of about 5 percent by weight up to about 95 percent by weight of the fragrance composition.

- 20 The fragrance composition may alternatively or additionally contain other perfumery materials. additional perfumery materials which may form part of compositions of the invention include: natural essential oils such as lemon oil, mandarin oil, clove leaf oil, 25 petitgrain oil, cedar wood oil, patchouli oil, lavandin oil, neroli oil, ylang oil, rose absolute or jasmine absolute; natural resins such as labdanum resin or olibanum resin; single perfumery chemicals which may be isolated from natural sources or manufactures synthetically, as for 30 example, alcohols such as geraniol, nerol, citronellol, linalol, tetrahydrogeraniol, beta-phenylethyl alcohol, methyl phenyl carbinol, dimethyl benzyl carbinol, menthol or cedrol; acetates and other esters derived from such alcohols; aldehydes such as citral, citronellal, 35 hydroxycitronellal, lauric aldehyde, undecylenic aldehyde,
- cinnamaldehyde, amyl cinnamic aldehyde, undecylenic aldehyde, cinnamaldehyde, amyl cinnamic aldehyde, vanillin or heliotropin; acetals derived from such aldehydes; ketones

such as methyl hexyl ketone, the ionones and the methylionones; phenolic compounds such as eugenol and isoeugenol; other synthetic musks such as musk xylene, musk ketone, hexamethylisochroman, 5-acetyl-

- isopropyltetramethylindane, 6-acetyl-hexamethyltetralin (TETRALIDE®, a registered trademark of Bush Boake Allen Limited), 5-acetyl-hexamethylindane, and ethylene brassylate; and other materials commonly employed in the art of perfumery. Typically at least five, and usually at least ten, of such materials will be present as components of the active ingredient. The amount of the additional perfumery material will vary depending upon the particular perfumery material employed and use intended, as will be apparent to those skilled in the art.
- Fragrance compositions and preparatory techniques are well known in the art, and are disclosed, for example, in "Soap, Perfumery and Cosmetics", by W.A. Poucher, 7th edition, published by Chapman & Hall (London) (1959); "Perfume and Flavour Chemicals", by S. Arctander, published by the author (Montclair) (1959); and "Perfume and Flavour Materials of Natural Origin", also by S. Arctander, self-published (Elizabeth, NJ) (1960), the disclosures of each of which are incorporated herein by reference, in their entirety.
- This invention is further described in the following Examples 1-4, which illustrate methods of preparation for compounds of the invention. Examples 1-4 are prophetic examples. A summary of these examples is set forth below. These examples are intended to be illustrative only, and are not to be construed as limiting the scope of the appended claims.

Example 1 describes the preparation of 6-formyl-1,1,2,4,4,7-hexamethyl-5-methoxy-1,2,3,4-tetrahydro-naphthalene, a compound of Formula I wherein R¹ is -OCH₃, R² is -C(O)H, R³ is -CH₃, R⁴ is -H, R⁵ is -CH₃, R⁶ is -CH₃, R⁷ is -CH₃, R⁸ is -H, R⁹ is -CH₃ and R¹⁰ is -CH₃.

Example 2 describes the preparation of 6-formyl-1,1,2,4,4,5-hexamethyl-7-methoxy-1,2,3,4-tetrahydronaphthalene, a compound of Formula I wherein \mathbb{R}^1 is $-CH_3$, \mathbb{R}^2 is -C(O)H, \mathbb{R}^3 is -OCH3, \mathbb{R}^4 is -H, \mathbb{R}^5 is -CH3, \mathbb{R}^6 is -CH3, \mathbb{R}^7 is -5 CH_3 , R^8 is -H, R^9 is -CH $_3$ and R^{10} is -CH $_3$.

Example 3 describes the preparation of 6-formyl-1,1,2,4,4-pentamethyl-5,7-dimethoxy-1,2,3,4-tetrahydronaphthalene, a compound of Formula I wherein R^1 is $-OCH_3$, R^2 is -C(O)H, R^3 is -OCH₃, R^4 is -H, R^5 is -CH₃, R^6 is -CH₃, R^7 is 10 -CH₃, R^8 is -H, R^9 is -CH₃ and R^{10} is -CH₃.

Example 4 describes the preparation of 7-formyl-1,1,2,4,4-pentamethyl-5-methoxy-1,2,3,4-tetrahydronaphthalene, a compound of Formula I wherein R^{1} is $-OCH_{3}$, R^{2} is -H, \mathbb{R}^3 is -C(0)H, \mathbb{R}^4 is -H, \mathbb{R}^5 is -CH₃, \mathbb{R}^6 is -CH₃, \mathbb{R}^7 is -

15 CH_3 , R^8 is -H, R^9 is -CH₃ and R^{10} is -CH₃.

Example 1

Preparation of 6-Formyl-1,1,2,4,4,7-Hexamethyl-5-Methoxy-1,2,3,4-Tetrahydronaphthalene

Using a Perrier modification, Perrier, Chem. Ber., 20 Vol. 33, pp. 819 et seq. (1900), and Perrier, Bull. Soc. Chim. France, pp. 859 et seq. (1904), m-cresol methyl ether (122.0 g) is reacted with acetyl chloride (72.0 g), methylene chloride (500 ml), and aluminum chloride (145.0 g) to provide a mixture of 2-methoxy-4-methyl-acetophenone and 25 4-methoxy-2-methyl-acetophenone. After standard quenching, separation, drying and solvent evaporation, the mixture is distilled on a spinning band distillation column under vacuum to separate the components.

Methylmagnesium bromide (3.0 M, 100 ml) (which may 30 be obtained from Aldrich Chemical Company, Inc., Milwaukee, WI) in ether is added at room temperature to a 250 ml fournecked round bottom flask equipped with an air stirrer, septum, Claisen adapter (thermocouple and dry ice condenser attached) and nitrogen inlet tube. To this is then slowly 35 added 2-methoxy-4-methyl-acetophenone (22.53 g). After about 2 hours, an aliquot of additional Grignard (20 ml) is added. The solution is then heated at 60°C for about one hour, and quenched with aqueous NH4Cl. The aqueous layer is

then washed several times with methyl tert-butyl ether and rotoevaporated to yield a crude product mixture containing 1-[2'-methoxy-4'-methylphenyl]-1-methylethanol. The product mixture is then fractionated under reduced pressure to further purify the 1-[2'-methoxy-4'-methylphenyl]-1-methylethanol.

Next, 1-[2'-methoxy-4'-methylphenyl]-1methylethanol is converted to 1,1,2,4,4,7-hexamethyl-5methoxy-1,2,3,4-tetrahydronaphthalene by following 10 procedures similar to those described in European Patent Application Publication No. 0,393,742. Specifically, to a stirred solution of 10 ml $TiCl_4$ in 120 ml dichloromethane (cooled to -5°C under nitrogen); is added a mixture of 18.0 g of 1-[2'-methoxy-4'-methylphenyl]-1-methylethanol and 16.8 15 g 2,3-dimethylbutene-1 over a two hour period. The reaction mixture is stirred for a further 30 mins at -5°C. Thereafter, it is poured into a mixture of 200 ml of water and 100 ml of concentrated hydrochloric acid and stirred for 15 mins. The organic phase is separated and the aqueous 20 phase washed twice with 50 ml dichloromethane. The combined organic phase is washed twice with 100 ml 10% hydrochloric acid solution, once with 100 ml water, twice with 100 ml 5% sodium carbonate solution, and finally once again with water, to yield as a crude product, 1,1,2,4,4,7-hexamethyl-25 5-methoxy-1,2,3,4-tetrahydro-naphthalene. After removal of the solvent, the crude product may be further purified by fractional distillation under reduced pressure.

To convert 1,1,2,4,4,7-hexamethyl-5-methoxy1,2,3,4-tetrahydronaphthalene to its corresponding 630 carboxaldehyde, a 250 ml flask is charged with 130 ml
dichloromethane and 24.51 g TiCl₄. The solution is cooled to
2°C and 14.9 g of 1,1,2,4,4,7-hexamethyl-5-methoxy-1,2,3,4tetrahydronaphthalene and 20 ml dichloromethane are added
with stirring. Then α,α-dichloromethyl methyl ether (13.37
35 g) is added over a period of 1.2 hours. After completion of
addition, the solution is allowed to warm to room
temperature. After a further half hour, the solution is

quenched with water at a temperature of \leq 8°C. The solution is distilled to remove residual starting material to yield a crude product containing the 6-carboxaldehyde, 6-formyl-1,1,2,4,4,7-hexamethyl-5-methoxy-1,2,3,4-

tetrahydronaphthalene. The crude product may then be further purified using further standard fractional distillation techniques.

Example 2

Preparation of 6-Formyl-1,1,2,4,4,5-Hexamethyl-7-Methoxy-1,2,3,4-Tetrahydronaphthalene

Using a Perrier modification, Perrier, Chem. Ber., Vol. 33, pp. 819 et seq. (1900), and Perrier, Bull. Soc. Chim. France, pp. 859 et seq. (1904), m-cresol methyl ether (122.0 g) is reacted with acetyl chloride (72.0 g),

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- 20 vacuum to separate the components.

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- 25 septum, Claisen adapter (thermocouple and dry ice condenser attached) and nitrogen inlet tube. To this is then slowly added 2-methyl-4-methoxy-acetophenone (22.53 g). about 2 hours, an aliquot of additional Grignard (20 ml) is The solution is then heated at 60°C for about one added.
- 30 hour, and quenched with aqueous NH_4Cl . The aqueous layer is then washed several times with methyl tert-butyl ether and rotoevaporated to yield a crude product mixture containing 1-[4'-methoxy-2'-methylphenyl]-1-methylethanol. The product mixture is then fractionated under reduced pressure to
- further purify the 1-[4'-methoxy-2'-methylphenyl]-1-methylethanol.

Next, 1-[4'-methoxy-2'-methylphenyl]-1methylethanol is converted to 1,1,2,4,4,5-hexamethyl-7-

methoxy-1,2,3,4-tetrahydronaphthalene by following procedures similar to those described in European Patent Application Publication No. 0,393,742. Specifically, to a stirred solution of 10 ml TiCl4 in 120 ml dichloro-methane 5 (cooled to -5°C under nitrogen), is added a mixture of 18.0 g of 1-[4'-methoxy-2'-methylphenyl]-1-methylethanol and 16.8 g 2,3-dimethylbutene-1 over a two hour period. The reaction mixture is stirred for a further 30 mins at -5°C. Thereafter, it is poured into a mixture of 200 ml of water 10 and 100 ml of concentrated hydrochloric acid and stirred for 15 mins. The organic phase is separated and the aqueous phase washed twice with 50 ml dichloromethane. The combined organic phase is washed twice with 100 ml 10% hydrochloric acid solution, once with 100 ml water, twice with 100 ml 5% 15 sodium carbonate solution, and finally once again with water, to yield as a crude product, 1,1,2,4,4,5-hexa-methyl-7-methoxy-1,2,3,4-tetrahydro-naphthalene. After removal of the solvent, the crude product is further purified by fractional distillation under reduced pressure.

20 To convert 1,1,2,4,4,5-hexamethyl-7-methoxy-1,2,3,4-tetrahydronaphthalene to its corresponding 6carboxaldehyde, a 250 ml flask is charged with 130 ml dichloromethane and 24.51 g TiCl4. The solution is cooled to 2°C and 14.9 g of 1,1,2,4,4,5-hexamethyl-7-methoxy-1,2,3,4-25 tetrahydronaphthalene and 20 ml dichloromethane are added with stirring. Then α, α -dichloromethyl methyl ether (13.37 g) is added over a period of 1.2 hours. After completion of addition, the solution is allowed to warm to room temperature. After a further half hour, the solution is 30 quenched with water at a temperature of \leq 8°C. The solution is distilled to remove residual starting material to yield a crude product containing the 6-carboxaldehyde, 6-formyl-1,1,2,4,4,5-hexamethyl-7-methoxy-1,2,3,4tetrahydronaphthalene. The crude product may then be 35 further purified using further standard fractional distillation techniques.

Example 3

Preparation of 6-Formyl-1,1,2,4,4-Pentamethyl-5,7-Dimethoxy-1,2,3,4-Tetrahydronaphthalene

Using a Perrier modification, Perrier, Chem. Ber., Vol. 33, pp. 819 et seq. (1900), and Perrier, Bull. Soc.

5 Chim. France, pp. 859 et seq. (1904), 1,3-dimethoxybenzene (138.0 g) (which may be obtained from Aldrich Chemical Company, Inc., Milwaukee, WI) is reacted with acetyl chloride (72.0 g), methylene chloride (500 ml), and aluminum chloride (145.0 g) to provide 2',4'-dimethoxy-acetophenone, which may then be purified using standard vacuum fractional distillation.

Methylmagnesium bromide (3.0 M, 100 ml) (which may be obtained from Aldrich Chemical Company, Inc., Milwaukee, WI) in ether is added at room temperature to a 250 ml four15 necked round bottom flask equipped with an air stirrer, septum, Claisen adapter (thermocouple and dry ice condenser attached) and nitrogen inlet tube. To this is then slowly added 2',4'-dimethoxy-acetophenone (24.73 g). After about 2 hours, an aliquot of additional Grignard (20 ml) is added.
20 The solution is then heated at 60°C for about one hour, and quenched with aqueous NH₄Cl. The aqueous layer is then washed several times with methyl tert-butyl ether and rotoevaporated to yield a crude product mixture containing 1-[2',4'-dimethoxyphenyl]-1-methylethanol. The product mixture is then fractionated under reduced pressure to

Next, 1-[2',4'-dimethoxyphenyl]-1-methylethanol is converted to 1,1,2,4,4-pentamethyl-5,7-dimethoxy-1,2,3,4
tetrahydronaphthalene by following procedures similar to those described in European Patent Application Publication No. 0,393,742. Specifically, to a stirred solution of 10 ml TiCl₄ in 120 ml dichloromethane (cooled to -5°C under nitrogen), is added a mixture of 19.61 g of 1-[2',4'-dimethoxyphenyl]-1-methylethanol and 16.8 g 2,3-dimethylbutene-1 over a two hour period. The reaction mixture is stirred for a further 30 mins at -5°C. Thereafter, it is poured into a mixture of 200 ml of water

further purify the 1-[2',4'-dimethoxyphenyl]-1-

methylethanol.

and 100 ml of concentrated hydrochloric acid and stirred for 15 mins. The organic phase is separated and the aqueous phase washed twice with 50 ml dichloromethane. The combined organic phase is washed twice with 100 ml 10% hydrochloric acid solution, once with 100 ml water, twice with 100 ml 5% sodium carbonate solution, and finally once again with water, to yield as a crude product, 1,1,2,4,4-pentamethyl-5,7-dimethoxy-1,2,3,4-tetrahydronaphthalene. After removal of the solvent, the crude product Is further purified by fractional distillation under reduced pressure.

To convert 1,1,2,4,4-pentamethyl-5,7-dimethoxy1,2,3,4-tetrahydronaphthalene to its corresponding 6carboxaldehyde, a 250 ml flask is charged with 130 ml
dichloromethane and 24.51 g TiCl₄. The solution is cooled to
2°C and 15.87 g of 1,1,2,4,4-pentamethyl-5,7-dimethoxy1,2,3,4-tetrahydronaphthalene and 20 ml dichloromethane are
added with stirring. Then α,α-dichloro methyl methyl ether
(13.37 g) is added over a period of 1.2 hours. After
completion of addition, the solution is allowed to warm to
20 room temperature. After a further half hour, the solution
is quenched with water at a temperature of ≤ 8°C. The
solution is distilled to remove residual starting material
to yield a crude product containing the 6-carboxaldehyde, 6formyl-1,1,2,4,4-pentamethyl-5,7-dimethoxy-1,2,3,4-

25 tetrahydro-naphthalene. The crude product may then be further purified using further standard fractional distillation techniques.

Example 4

Preparation of 7-Formyl-1,1,2,4,4-Pentamethyl-30 5-Methoxy-1,2,3,4-Tetrahydronaphthalene

Using a Perrier modification, Perrier, Chem. Ber., Vol. 33, pp. 819 et seq. (1900), and Perrier, Bull. Soc. Chim. France, pp. 859 et seq. (1904), m-cresol methyl ether (122.0 g) is reacted with acetyl chloride (72.0 g),

methylene chloride (500 ml), and aluminum chloride (145.0 g) to provide a mixture of 2-methoxy-4-methyl-acetophenone and 4-methoxy-2-methyl-acetophenone. After standard quenching, separation, drying and solvent evaporation, the mixture is

distilled on a spinning band distillation column under vacuum to separate the components.

Methylmagnesium bromide (3.0 M, 100 ml) (which may be obtained from Aldrich Chemical Company, Inc., Milwaukee, 5 WI) in ether is added at room temperature to a 250 ml fournecked round bottom flask equipped with an air stirrer, septum, Claisen adapter (thermocouple and dry ice condenser attached) and nitrogen inlet tube. To this is then slowly added 2-methoxy-4-methyl-acetophenone (22.53 g). After 10 about 2 hours, an aliquot of additional Grignard (20 ml) is added. The solution is then heated at 60°C for about one hour, and quenched with aqueous NH4Cl. The aqueous layer is then washed several times with methyl tert-butyl ether and rotoevaporated to yield a crude product mixture containing 15 1-[2'-methoxy-4'-methylphenyl]-1-methylethanol. The product mixture is then fractionated under reduced pressure to further purify the 1-[2'-methoxy-4'-methylphenyl]-1methylethanol.

Next, 1-[2'-methoxy-4'-methylphenyl]-1-20 methylethanol is converted to 1,1,2,4,4,7-hexamethyl-5methoxy-1,2,3,4-tetrahydronaphthalene by following procedures similar to those described in European Patent Application Publication No. 0,393,742. Specifically, to a stirred solution of 10 ml TiCl4 in 120 ml dichloro-methane 25 (cooled to -5°C under nitrogen), is added a mixture of 18.0 g of 1-[2'-methoxy-4'-methylphenyl]-1-methylethanol and 16.8 q 2,3-dimethylbut-1-ene over a two hour period. reaction mixture is stirred for a further 30 mins at -5°C. Thereafter, it is poured into a mixture of 200 ml of water 30 and 100 ml of concentrated hydrochloric acid and stirred for 15 mins. The organic phase is separated and the aqueous phase washed twice with 50 ml dichloromethane. The combined organic phase is washed twice with 100 ml 10% hydrochloric acid solution, once with 100 ml water, twice with 100 ml 5% sodium carbonate solution, and finally once again with water, to yield as a crude product, 1,1,2,4,4,7-hexamethyl-5-methoxy-1,2,3,4-tetrahydro-naphthalene. After removal of

the solvent, the crude product is further purified by fractional distillation under reduced pressure.

To convert 1,1,2,4,4,7-hexamethyl-5-methoxy-1,2,3,4-tetrahydronaphthalene to 7-formyl-1,1,2,4,4-

- pentamethyl-5-methoxy-1,2,3,4-tetrahydronaphthalene, the oxidation procedures of Syper, Tetrahedron Letters, No. 37, pp. 4493-4498 (1966) are substantially followed. Specifically, to a solution of 14.8 g of 1,1,2,4,4,7-hexamethyl-5-methoxy-1,2,3,4-tetrahydronaphthalene in 300 ml
- of 50% aqueous acetic acid is prepared. While stirring, to this is added dropwise a solution of 131.5 g ceric ammonium nitrate in the same acid (600 ml), at 100°C. The solution is then cooled to room temperature, diluted with water, extracted three times with ether, and dried with MgSO₄, to
- 15 yield the 7-carboxaldehyde, 7-formyl-1,1,2,4,4-pentamethyl-5-methoxy-1,2,3,4-tetrahydro-naphthalene.

The disclosures of each patent and publication cited or described herein are hereby incorporated herein by reference, in their entirety.

Various modifications of the invention, in addition to those shown and described herein, will be readily apparent to those skilled in the art from the foregoing description. Such modifications are also intended to fall within the scope of the appended claims.

What is claimed is:

A compound of the formula:

(I)

wherein

R¹ is -CH₃, -CH₂CH₃, -OCH₃ or -OH,

R² and R³ are, independently, -H, -CH₃, -CH₂CH₃,

-OCH₃, -OH or -C(O)H,

R⁴ is -H,

R⁵ is -H, -CH₃ or -CH₂CH₃,

or R⁴ and R⁵, taken together, are -(CH₂)₂-,

R⁶ is -CH₃ or -CH₂CH₃,

R⁷ is -H, -CH₃ or -CH₂CH₃,

or R⁶ and R⁷, taken together, are -(CH₂)₃-,

R⁸ and R⁹ are, independently, -H, -CH₃ or -CH₂CH₃,

15 and

R10 is -CH3,

provided that

(i) one of R^2 and R^3 is -C(0)H, and one of R^2 and R^3 is other than -C(0)H,

20 (ii) no more than one of R⁵ and R⁹ is -H,

(iii) no more than one of R^5 , R^6 , R^7 , R^8 and R^9 is $-CH_2CH_3$,

(iv) when R^1 is $-OCH_3$, then R^2 and R^3 are other than -H or -OH,

25 (v) when R^1 is -OH, then R^2 and R^3 are other than -OH or -OCH₃,

(vi) when R^1 is $-CH_3$ or $-CH_2CH_3$, then at least one of R^7 and R^8 are H,

(vii) when R^4 and R^5 , taken together, are $-(CH_2)_2 -, \text{ then } R^1 \text{ is } -OCH_3 \text{ or } -OH, R^7 \text{ is } -H,$ and $R^8 \text{ is } -H,$

10

- (viii) when R^6 and R^7 , taken together, are $-(CH_2)_3-$, then R^1 is $-OCH_3$ or -OH, and R^8 is -H,
- when R¹ is -CH₃ or -CH₂CH₃, then one of R² and R³ is -OCH₃ or -OH; and
 - (x) when R^1 is -OCH₃ or -OH, R^3 is -CH₃ or -CH₂CH₃, and both R^7 and R^8 are -H, then at least one of R^5 , R^6 and R^9 is other than -CH₃.
 - 2. A compound of Claim 1 wherein \mathbb{R}^1 is $-CH_3$, -OH or $-OCH_3$.
 - 3. A compound of Claim 1 wherein R² is -C(O)H.
- 4. A compound of Claim 1 wherein R^3 is $-CH_3$ or $-CH_2CH_3$.
 - 5. A compound of Claim 1 wherein R^1 is -OH or -OCH₃, R^2 is -C(O)H, R^3 is -CH₃ or -CH₂CH₃, R^4 is -H, R^5 is -CH₃, R^6 is -CH₃, R^7 is -H or -CH₃, R^8 is -H or -CH₃, R^9 is -CH₃, and R^{10} is -CH₃.
- 20 6. A compound of Claim 1 wherein R^1 is -OH or -OCH₃, R^2 is -C(O)H, R^3 is -CH₃, R^4 and R^5 , taken together, are -(CH₂)₂-, R^6 is -CH₃, R^7 is -H, R^8 is -H, R^9 is -CH₃, and R^{10} is -CH₃.
- 7. A compound of Claim 1 wherein R^1 is -OH or 25 -OCH₃, R^2 is -C(O)H, R^3 is -CH₃, R^4 is -H, R^5 is -CH₃, R^6 and R^7 , taken together, are -(CH₂)₃-, R^8 is -H, R^9 is -CH₃, and R^{10} is -CH₃.
- 8. A compound of Claim 1 wherein R^1 is $-OCH_3$, R^2 is -C(O)H, R^3 is $-CH_3$, R^4 is -H, R^5 is $-CH_3$, R^6 is $-CH_3$, R^7 is -H, 30 R^8 is $-CH_3$, R^9 is $-CH_3$, and R^{10} is $-CH_3$.

- 9. A compound of Claim 1 wherein R^1 is $-OCH_3$, R^2 is -C(O)H, R^3 is $-OCH_3$, R^4 is -H, R^5 is $-CH_3$, R^6 is $-CH_3$, R^7 is -H, R^8 is -H, R^9 is $-CH_3$, and R^{10} is $-CH_3$.
- 10. A compound of Claim 1 wherein R^1 is $-OCH_3$, R^2 is -C(O)H, R^3 is $-OCH_3$, R^4 is -H, R^5 is $-CH_3$, R^6 is $-CH_3$, R^7 is $-CH_3$, R^8 is -H, R^9 is $-CH_3$ and R^{10} is $-CH_3$.
 - 11. A compound of Claim 1 wherein R^1 is $-OCH_3$, R^2 is -H, R^3 is -C(0)H, R^4 is -H, R^5 is $-CH_3$, R^6 is $-CH_3$, R^7 is $-CH_3$, R^8 is -H, R^9 is $-CH_3$ and R^{10} is $-CH_3$.
- 10 12. A compound of Claim 1 wherein R^1 is $-OCH_3$, R^2 is -C(O)H, R^3 is $-CH_3$, R^4 is -H, R^5 is $-CH_3$, R^6 is $-CH_3$, R^7 is $-CH_3$, R^8 is -H, R^9 is $-CH_3$, and R^{10} is $-CH_3$.
- 13. A compound of Claim 1 wherein R^1 is $-OCH_3$, R^2 is -C(O)H, R^3 is $-CH_2CH_3$, R^4 is -H, R^5 is $-CH_3$, R^6 is $-CH_3$, R^7 is $-CH_3$, R^8 is -H, R^9 is $-CH_3$, and R^{10} is $-CH_3$.
 - 14. A compound of Claim 1 wherein R^1 is -OH, R^2 is -C(O)H, R^3 is -CH₃, R^4 is -H, R^5 is -CH₃, R^6 is -CH₃, R^7 is -CH₃, R^8 is -H, R^9 is -CH₃, and R^{10} is -CH₃.
- 15. A compound of Claim 1 wherein R^1 is -OH, R^2 is 20 -C(O)H, R^3 is -CH₂CH₃, R^4 is -H, R^5 is -CH₃, R^6 is -CH₃, R^7 is -CH₃, R^8 is -H, R^9 is -CH₃, and R^{10} is -CH₃.
 - 16. A fragrance composition comprising a compound of Claim 1 in combination with at least one of a carrier and additional perfumery material.
- 25 17. A fragrance composition comprising a compound of Claim 9 in combination with at least one of a carrier and additional perfumery material.

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18. A fragrance composition comprising a compound of Claim 11 in combination with at least one of a carrier and additional perfumery material.

- 19. A fragrance composition comprising a compound5 of Claim 13 in combination with at least one of a carrier and additional perfumery material.
 - 20. A method of modifying the olfactory properties of a composition comprising adding thereto an olfactorily effective amount of a compound of Claim 1.
- 21. A method of modifying the olfactory properties of a composition comprising adding thereto an olfactorily effective amount of a compound of Claim 9.
- 22. A method of modifying the olfactory properties of a composition comprising adding thereto an olfactorily effective amount of a compound of Claim 11.
 - 23. A method of modifying the olfactory properties of a composition comprising adding thereto an olfactorily effective amount of a compound of Claim 13.
 - 24. A product produced by the method of Claim 20.
- 20 25. A product produced by the method of Claim 21.
 - 26. A product produced by the method of Claim 22.
 - 27. A product produced by the method of Claim 23.

INTERNATIONAL SEARCH REPORT

Internat unal application No. PCT/US94/13960

A. CI	ASSIFICATION OF SUBJECT MATTER			
IPC(6)	:C07C 49/215; A61K 7/46	-		
US CL	:568/327 340: 512/17			
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